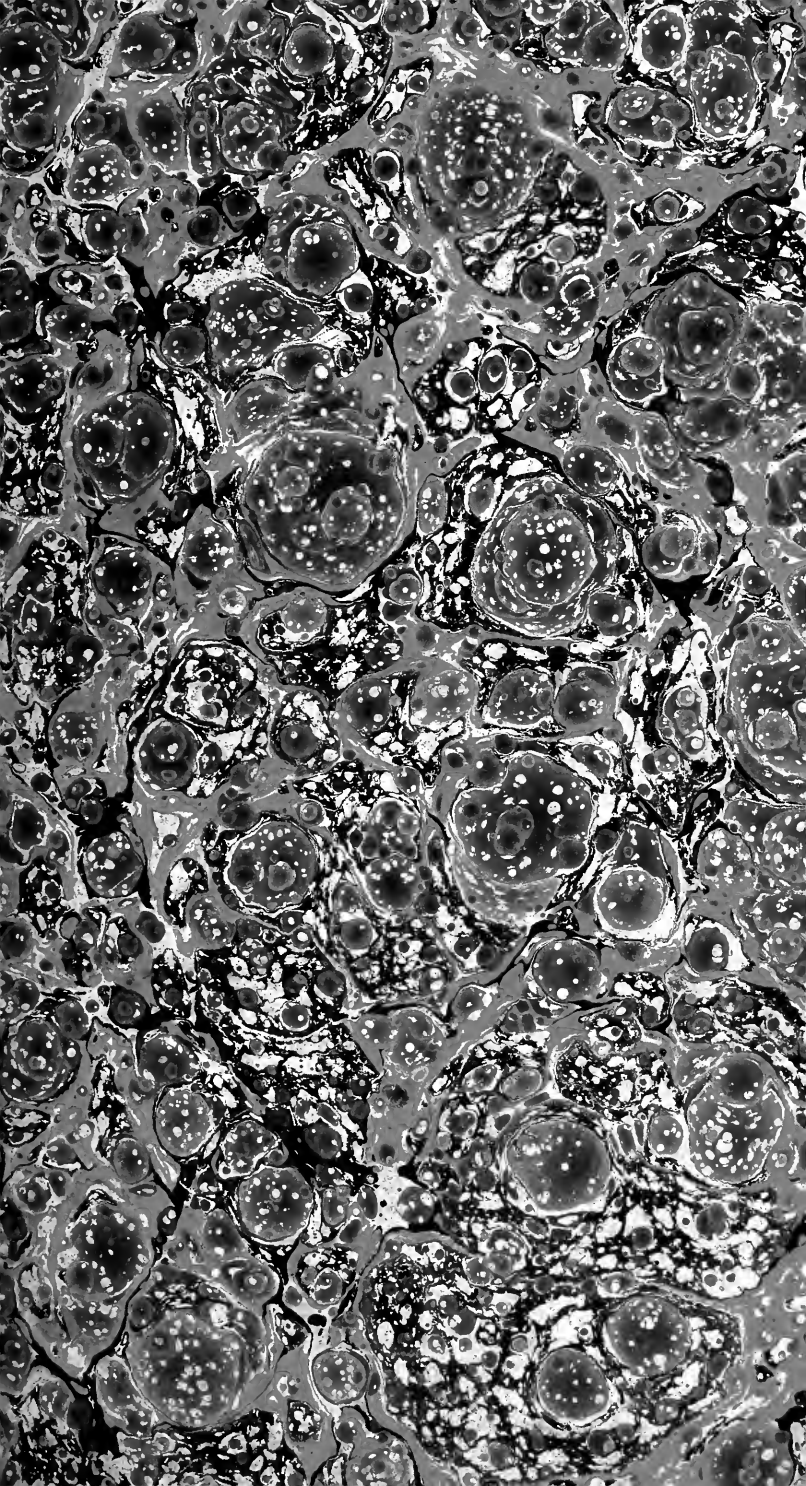
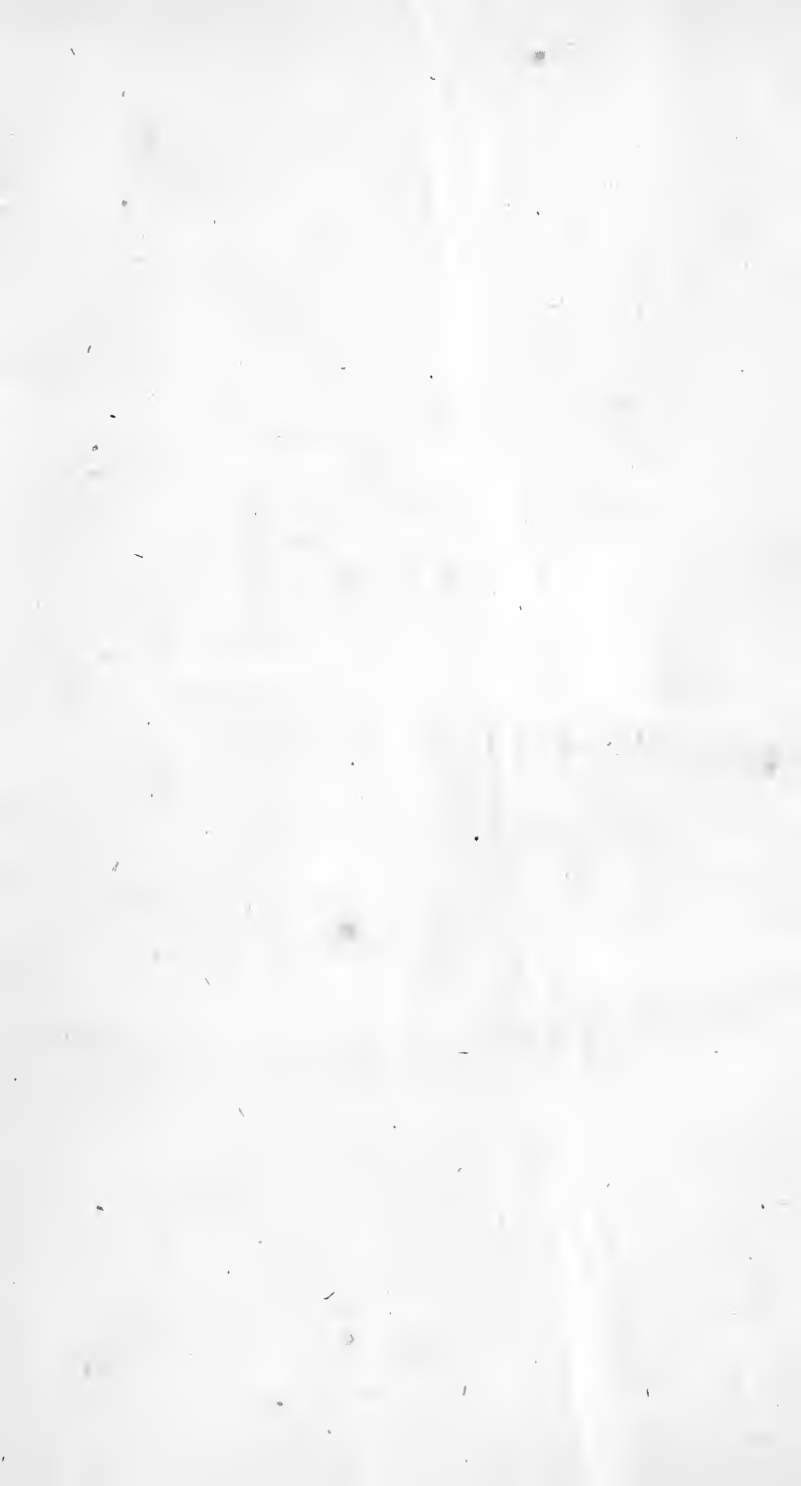


*A. L. Pearson.*



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**A SKETCH**  
**OF**  
**FEBRILE DISEASES.**

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STOCKTON: PRINTED BY T. EELES.

1850



A  
SKETCH  
OF THE  
HISTORY AND CURE  
OF  
FEBRILE DISEASES;  
*MORE PARTICULARLY AS THEY APPEAR*  
IN THE  
WEST-INDIES  
AMONG THE SOLDIERS OF THE BRITISH ARMY.

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BY   
ROBERT JACKSON, M. D.

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*SECOND EDITION, WITH MANY ADDITIONS.*

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IN TWO VOLUMES.

VOL. I.

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## PREFACE.

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**A** SKETCH of the history and cure of endemic fever was published by the author in the year 1817. It is now reprinted with additions; not because it is called for by the public, but because the author is desirous, before he may go hence, to leave the sum of what he has observed on the subject in a form that is intelligible and as easy to be understood as he is able to make it. The matter of the work he believes to be valuable, in as much as it is drawn directly from original sources and committed to paper without prepossession. The manner is not attractive; and, as he does not know that he is capable of making it attractive, however much he might labour to do so, he abstains from attempting embellishment, satisfied, on the score of composition, if his meaning be expressed without ambiguity.

The Author may be allowed to consider himself a medical veteran. He is on the verge of seventy, and has spent a large portion of his time in real service, much of it in foreign countries. His actual experience has been considerable; his means of profiting by the experience of others have been comparatively few. His finances, which were small originally, failed almost before his professional studies were begun. One course of lectures on anatomy and surgery, and one course on the practice of medicine, at the university of Edinburgh, comprehend the sum of the instruction which he drew from public seminaries of medical learning. As he had not the means of opening the halls of accredited teachers, or of obtaining admission into hospitals for lessons on the cure of disease, he was compelled by his necessities to look for other guides. He laboured for several years to find them; he laboured with ardour, but under disadvantages: he must leave it to others to judge whether or not he has laboured in vain.

It is proper that the reader be informed in this place that the author went to the West-Indies at an early period of his life, with very rude notions of the theory of the medical art,

and with scarcely any correct knowledge of its practice. Chance threw in his way the opportunity of observing the rise, progress and issue of the more common diseases of the tropical climate, in a company of soldiers who were stationed at the place where he resided. From observations made on the diseases of this small body of men, he was led to form an outline of rules for the direction of his practice in the cure of fevers;—very rude he admits, but, as drawn from direct observation, not unimportant. The basis of the proceeding which he adopted on this occasion appeared to be grounded in a law of Nature. It was applied with comparative good effect in the scene where he was; but the scene was narrow; and, as his desire of professional knowledge was great, he went to North America in the year 1778, in expectation of finding better opportunities of attaining his object than were likely to present to him in the island of Jamaica. He served with the army in America from the month of May, 1778, to the termination of the war; during which service he had the means of observing the health history of an entire corps, acting in a climate that could not be considered healthy. The sphere of observation was still

narrow: the facts which presented were precise, such as afforded grounds for reflection. The sum of his observation on endemic fever was submitted to the public in the year 1791, but the subject was not sufficiently developed in that publication. It still engaged his attention; and, desirous of further information on the subject than the walk of a physician in civil life was likely to present, he offered service, and re-entered the army at an early period of the war, 1793. The field which was then placed before him was extensive; and, while extensive, it was so varied that he thinks he is enabled, from the materials which it supplied, to fill up, with satisfaction to himself, and he is encouraged to hope not without benefit to others; the practical view of the treatment of fever which he had sketched rudely at an early period of life.

The author had not, as already observed, the advantage of receiving medical instruction from the authorized teachers of the medical art to the same extent as the generality of medical students; he had not even been enabled to glean much from the more celebrated of the medical writers. Hippocrates, Galen and Sydenham could not be said to be known to him, except by name, until after the year

1786. The works of Mr. Hunter, Dr. John Brown and Dr. Darwin, with whom his views have more or less of correspondence, did not fall in his way until the year 1810, when his opinions were digested into nearly the same form in which they now are. He had seen something of common practice under common practitioners; the results did not correspond with what he expected. Desirous to know what is truth, and disposed not to be satisfied with less than truth, he proceeded to seek for it in his own experience. He had studied anatomy, and considered the laws of animal economy with care and attention in so far as his circumscribed means enabled him to go. With this preliminary, he believed that the correct history of the disease, and the most effectual manner of removing it, would be best attained by writing down at the bed-side of the sick—military or others, a summary of the rise, progress and issue of the maladies which came under notice, marking with care the changes which took place, the periods at which they did take place, the medical means prescribed, the effect produced by the prescription, in so far as it was discernible, adding, as often as leave was obtained, to open the dead body, a note of remarks on the tra-

ces left on organic structure by the form of action which the disease constitutionally or casually assumed.

The diseases which came under notice on this occasion, were such as are called endemic. The symptoms, as viewed superficially, were different in form and degree, so different in many instances as if the cause were essentially and radically different. The fluctuating variety of appearances was a cause of embarrassment to such extent as, at one time, to make an impression that the attainment of knowledge in the medical art, as an art resting on a base of science, was almost a hopeless expectation:—the forward act of the disease was confused; the effect or issue apparently uncertain, or of difficult calculation. The cases which were taken down in the manner stated amounted in a short time to a considerable number. They were analyzed carefully, with a view to ascertain in how far the history, in all its varieties, was under a law of constitutional animal organism, or a result of mere contingency. The cases alluded to were extremely unlike in superficial appearance; they produced, when compared and closely considered in all their relations with each other, such marks of radical resem-



blance as clearly proved identity. This discovery, as not altogether expected, threw a ray of light upon the author's view. It animated his pursuit, and served, in some degree, as a guide to his future researches.

As the human body appears to be a complicated machine, consisting of parts of various form calculated for the performance of various function, differently expressed according to difference of structure, and so constituted as to be animated with one life throughout, susceptible of the impressions of various agencies, and capable of reacting correspondently with the nature of the impression; so in the condition which is commonly called health, the whole series of organic systems move in order and harmony; that is, by impression and reaction in reciprocity, performed distinctly and regularly for utility and pleasure, according to the law imposed upon matter by the hand of the Creator. The power of the agency is various in degree of force in its original form; it is subject to suffer changes through contingency. The condition of vitality has different degrees of susceptibility to impression, and different degrees of capacity of reacting—constitutional or contingent. The health of the system may be said to con-

sist in a just balance of action and reaction ; that is, a reciprocal and proportionate movement of action and reaction through all parts of the organic series. The balance is liable to be disturbed or subverted, more generally or more locally, by the impulse of a variety of agencies ; and, under the disturbance or subversion thus produced, new forms of action are liable to arise, so defined in their circumstances, as to bear the name of disease. The new act is artificial and unnatural ; its evolution produces pain and impediment ; its issue or effect is often destructive of life—in a part or in the whole.

The author has been led, by the observation of what experience presented to him in the exercise of his profession, to consider the disease commonly called fever as a form of changed or perverted organic action ; that is, a new form of life, impressed on the minuter series of organic capillaries, varied in expression according to the varied structure of the series upon which the act is principally manifested, or the course which it assumes—progressive or retrograde. The diseased act is liable to change, or to suffer transfer from one series to another in various ways and manners, and at various periods of time ; and

thus to exhibit within the limit of the total duration, a scene of fluctuation and uncertainty which is more or less embarrassing to the observer. When the diseased circle is completed, if the structure of parts, essential to the continuance of general life, be not destroyed by the violence of the new or diseased act, the habit regains its susceptibility to the impression of the causes which excite and maintain the actions of the system in their customary course; consequently the customary action of health is reproduced by this impression; and, when thus reproduced, it is not unfrequently re-established in its pristine vigour without artificial aid. On other occasions, instead of distinct and decided cessation followed by the reappearance of the action which characterizes the condition of health, there is only a pause in the morbid movement. The diseased act recurs either immediately or after an interval, sometimes on the same series of parts, so as to produce a form of action of the same character as that which preceded; sometimes on a different series, so as to produce forms of action more or less diversified—not unfrequently totally unlike the original. It is evident, from a close observation of the proceeding, that the impression of the mate-

rial, whatever it may be, which excites the train of symptoms distinguished by the term fever, produces a change in the action of the minuter series of organic tissues, varied in form and degree by a multitude of contingent circumstances, but still changed, however slightly, from that order and harmony in movement which obtains in health, which in fact constitutes the healthy condition. This is obvious to the senses. If it be admitted as a base on which to reason, it follows by necessary consequence that, preliminary of every attempt to reproduce that form of action in the system which is indispensable to health, the course of that which is unnatural or diseased must be distinctly and peremptorily arrested. When the arrest is effected, the form of movement in which health consists, frequently, as already observed, reappears without the application of artificial means; it sometimes does not reappear without the aid of strong ones. The power of the means required to arrest the decidedly diseased course, or to excite languid and reluctant movement in the channels of health, varies in almost every individual case; and, while varying multifariously in degree, it also requires to be variously applied according to the circum-

stances of the subject, viz. the degree of intensity in the act, and the character of the organism of the part or series of parts upon which the act is principally manifested.

The author considers endemic fever, whether it appear in the torrid or temperate zones of the earth, to be radically one disease. The outline description of it, which is given in the following pages, is compiled from materials that were collected in fields which supplied extensive means of observation. The materials are genuine; they are not analyzed with skill. They were put into form originally without prepossession, almost without knowledge of what had been written by others; for it may be proper to observe in this place, that the author scarcely ever consulted a medical book until after the year 1786; and that, as he then lived in a provincial town, where he had not the means of referring to others than such as the state of narrow finances enabled him to purchase, his reading was necessarily circumscribed. The descriptions may therefore be supposed to be a transcript of what presented in his own experience.—It is genuine as matter of fact; it is not skilfully adjusted in its order; it is moreover embarrassed by what may perhaps be considered

unnecessary minuteness of detail, and by comprehending various interchanges in the modes of acting, under one head. The forms of endemic fever are in fact extremely diversified, the symptoms so opposite in their nature to each other on many occasions, as to produce the distinctions of inflammatory, putrid, nervous, bilious, simple, complicated, mild, malignant, &c. from the operation of a cause that is distinctly and demonstratively one. But though a disease of diversified appearance be produced by the impression of one radical cause, the outline of two modes only are more or less prominent in every one of these diversified conditions. The one which is progressive may be considered as a creative act—a mode of new life. It produces a new material, which subverts temporarily or permanently the movement of the constitutional action of the system; not unfrequently extinguishes the life of the whole. The mode which is regressive or retrograde instead of creation, operates a solution of continuity, that is, produces the dissolution of vital organization. The progressive act, which is variously modified by a multitude of contingencies, exhibits great variety in degree of intensity; the regressive has also its different

rates of regression. As the act, whether progressive or regressive, varies under contingencies, so it changes mode, or suffers transfer from one series to another at certain periods of its course, to such extent and in such manner as to appear totally unlike itself. The modes of febrile action are, as now observed, numerous, and, as superficially viewed, totally unlike one another. The author considers them as resting on a common base, consequently as one disease. Systematic writers consider them as genera and species, consequently consider them as originating from radical difference of cause, or such form of modification in the cause as produces a specific difference in the act. The history of differences or distinctions constitutes what is called nosology, a study of much importance to medical science; but, in so far as respects endemic fever, a study of much perplexity and of less than utility, as labouring to discriminate where there is no radical difference, or to bring the products of chance under a constituted law of nature. The distinctions assumed do not rest on a stable base; they fluctuate and change from obvious or less obvious causes, in a manner that evidently shows that there is no barrier within the limits of the

class which is not liable to be broken by contingency—medical treatment, or mere accident. This conclusion arises from an analysis of the materials which have fallen under the eye of the author in a course of long experience. It simplifies the subject; and, though it may seem at first sight to throw confusion into the historical description of fever, it appears when closely studied and traced to a source, to establish the simplicity of the operations of nature, and to confirm the consistency of her laws throughout.

As the impressions of the material cause of fever operate changes on the organic actions of the system, varied in mode and degree according to contingent circumstances in cause and subject; so the means by which the course of the changed action is to be arrested, must necessarily be supposed to vary in power and manner of application, correspondently with the degree and mode of the error. The essence or being of fever evidently consists in a changed form of action of one kind or other; the cause which effects a change in that changed action must therefore, by direct inference, be positive of the force which subverts, or negative of the force which is necessary to maintain the existing order of things.



If this be admitted, the primary or initiative in the process for cure refers itself to the arrest or subversion of what is wrong; the second stimulating or coercive refers to and comprizes the various modes of exciting actions which are analogous to those of health. The mode of execution, though of considerable diversity, has two general outlines. If the diseased act be progressive, whether moderate or precipitate in its course, the arrest is effected by subduction of the cause which directly maintains it; if it be regressive or of a forward progress so slow as to give suspicion of stagnation, it is urged into the right course and animated to the just effect by the application of means which stimulate the languid power to exertion. Such is the outline view of the principle to be acted upon for the cure of fever. It is simple in itself; but, as it is to be applied to a subject which is complicated in its mechanism, the end is not attained in many cases without a combination of means which are apparently contradictory of each other. It is thus necessary, on many occasions, to subtract and to add almost at the same instant, or at very short intervals, that is to employ means of depletion and stimulation simultaneously, or successively and alter-

nately. The proceeding will be deemed absurd by those who do not study the mechanism of the living system in its intimate relations; it is proved in experience to be effectual, in as much as the purpose is attained, or success given to the act in a degree beyond the ordinary examples of success which arise from a simple process.

When the erroneous act is arrested, if that which is natural and healthy does not arise spontaneously from the impulse of causes, which commonly obtain in the scene of things where the diseased subject lies, the application of such means as are calculated to reproduce it becomes indispensable. The impulse of the circulating blood appears to be the immediate engine through which the operations of life are moved and maintained, whether in health or under disease. The subduction of that impulse from the acting organ must, therefore be considered as the direct means which controls the animal movements in all its forms. Blood-letting thus presents itself as the paramount remedy, direct or auxiliary of the arrest of the diseased course: it is decisive and final in one case; it is auxiliary, that is preparatory of the effective action of other remedies only in another. The extent to

which it may be carried without implying danger to life, and the power of its sanative effects on the course of febrile diseases, if not irrefragably proved by the details of the following pages, would scarcely obtain credit, and not long since would have been impeached as murder. It is the main engine of successful practice; it is not the sole remedy. A combination of means is necessary to the success of practice, so important in most cases that the author takes the liberty of earnestly recommending the consideration of it to the serious attention of the reader.

The matter of the present work is believed by its author to be of value. The style of composition is partly in fault: it has blemishes, perhaps not slight ones; they will be lightly censured, when the causes through which they may have arisen are expressed. The author formed the resolution at an early period of life, how originating he does not recollect, not to read a translated book. A desire of attaining knowledge of the history of men and things was strong in his mind; and, from this desire, he studied foreign languages with diligence, in hopes of being thereby enabled to penetrate to original sources of information. Through dint of labour he attained a mode-

rate knowledge of several; he is not a critical scholar in any. The most of what he reads even at the present time is in one or other of the foreign tongues; and, as we readily receive impression from that with which we most associate, the style of the present work probably exhibits too much of foreign idiom. He trusts it is intelligible; if it be peculiar, it is not through a desire of being singular that it is so.

A third part, entirely new, is added to the present edition. It contains a summary of inspection reports on military positions, barracks, and hospitals in the British possessions in the West-Indies, made between the years 1812 and 1815. The reports were submitted to the Commander of the Forces on the station at the time they were made, in the view of conveying information respecting the health of the military, and the military department of the state. They were made on account of the military; they belong properly speaking to the military service, and would not have been put before the public on this occasion, were it not believed that the matter is important in itself, and were it not apparent that, after a lapse of several years, no preparation is made by the executive to in-

investigate, with a view to know the state of the case. It is assumed, but not without reasonable proof, that European troops may be so stationed in the greater number of the islands in the West Indies, as to afford every protection to the civil inhabitant that military force can be supposed to afford; and, at the same time, to be so secured from the impressions of the cause of disease, as to suffer little in their health from change of climate. The choice of position and the construction of quarters are the points which principally conduce to this effect. Position and form of barrack construction therefore are, or ought to be scientifically considered by those who plan and execute the arrangements which relate to the health of the military. The subject cannot be supposed to be rightly understood, except by those who have intimate and correct knowledge of the power of the causes which act upon human health. Such, incredible as it may appear to the public, are not consulted in the case; and, apparently in disregard of the information which they are enabled to give, the ravage of disease is great at all times, enormously great at some. The executive power is sovereign; and, as it is ignorant of medical science, its sovereign act

is often directed so as to undermine its own fabric. No one it is believed maintains that the preservation of the health and lives of the military is not a desirable object. The value of preservation is admitted; the means of assuring it are not applied, ostensibly on account of expense. The case is not understood. It is asserted and not altogether at random, that the expense of filling up the military ranks, thinned by sicknesses which arise from bad position and badly constructed quarters, actually amounts, in the course of a few years, to a greater sum of money than would be required to erect barracks of the best form of construction, at the most eligible sites in the country, even at the extravagant price of Government contract. This I believe to be true; but if it be doubted, or cannot be comprehended without an exercise of intellect beyond what belongs to the operations of receipt and expenditure, it may be useful to show that all that is wanted may be attained without expense, or at an expense which scarcely deserves the name. Materials fit for the construction of houses, viz. stone, limestone, brick soil, and excellent timber of various kinds abound in profusion in most of the islands within the tropics, now occupied

by the British. Soldiers, natives of Europe, are capable of sustaining labour in all outdoor occupations, not only without injury to their health, but, if the arrangements be judiciously made with an increase of health and happiness beyond what belongs to their present condition. The British soldier, though not the most intelligent of the human race, has common sense, and is capable of common labour. As things are, there are few corps in the service which have not, in their ranks, a proportion of mechanics. These, with aid from the corps of professed artificers, attached to the ordnance and barrack department in the Windward and Leeward island station, may be supposed to be equal to the construction of quarters for themselves or others in any situation that may be deemed eligible from salubrity whether for the healthy or invalid. The proposition is distinct and comprehensible. No person, who is acquainted with the West-Indies, and the circumstances of the British service, can doubt of its practicability. The whole of the purposes connected with it are easily executed, and may in fact be executed at so little expense that the plea of economy, in its most limited sense, cannot be urged with propriety as a bar to

the undertaking. The object, which may be considered as an object of national importance, claims the attention of the legislative branch of the Government; there is presumption, amounting almost to proof, that it has no chance of obtaining it from the executive.



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## ERRATA.

### VOL. I.

*Page 16, line 27, for drunkard, read drunkards.*

— 18, — 30, for Soliel, read Soleil; and for Gaudeloupe, read Guadeloupe.

*Page 84, line last, the semicolon should be placed after ounces instead of the following word.*

*Page 162, line 16, after alluded, add to*

— 246, — 10, for administring, read administering.

### VOL. II.

*Page 140, line 27, for exampled, read unexampled*

— 248, — 28, for storeys, read stories

— 284, — 20, for peninsular, read peninsula.

— 295, — 21; page 304, line 19; page 321, line 18; and page 365, line 19; for jactation, read jactitation.

*Page 320, line 17, after morning, insert a period instead of a comma.*

— 383, — last; and page 384, line 8, for Lavana, read Savanna.



A

SKETCH

OF

FEBRILE DISEASES.

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PRELIMINARY STATEMENT.

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*Climate—General Feature of Medical Topography in the Windward and Leeward Islands—Locality—Seasons—Circumstances of Subject—Influence of unknown Causes acting Epidemically—Contagion, or Non contagion of the Disease termed Yellow Fever, in the West-Indies, North-America, and Gibraltar.*

**I**T is a fact of common observation that migration, from the native to a foreign soil, ordinarily acts on the existing condition of health either by deterioration or improvement. The unfavourable change is strikingly marked in persons who migrate from Europe, particularly in those who migrate from Great

Climate.

Britain and Ireland to the islands of the West-Indies. It is especially conspicuous during war; in as much as bodies of men, fortuitously collected and thrown together in masses by the exigencies of service, are then exposed to influences of climate without precaution in what relates to health. The conditions of the atmosphere in which man lives influence the movements of animal life. Increased degrees of atmospheric heat obviously stimulate animal action to higher degrees of activity; and if this be so, the high temperature of tropical latitude, acting as a direct and extra stimulant to the constitution of the transplanted European, may be reasonably supposed to excite disease through irritation where constitutional irritability is high; or conversely, it may act so as to improve health and vigour where the irritable power is latent or obscured.

The temperature of the atmosphere varies, more or less, in different latitudes within the tropical boundary. It appears to be generally of a lower degree in the southern than in the northern hemisphere; and, though sea temperature is nearly equal in the same latitudes of each hemisphere respectively, the sea coast temperature, owing to circumstances of locality, often varies considerably in the different islands which lie contiguously to each other. The degree of temperature varies during the winter and summer months. I do not pretend to state the difference precisely; but I believe it will rarely be found to exceed six degrees within eighteen degrees of the line, on either side. The degree of heat

between the morning and evening of the same day varies also, but rarely, I believe, beyond the extent of six degrees on level plains near the sea coast. The temperature of the atmosphere differs in the same island at the sea coast and in the interior, the difference bearing a proportion to the elevation of the interior. I cannot state the degree precisely, not having had the means to measure it correctly with an instrument; but, from the best idea I could form, it appeared to be about one degree in two hundred feet; sometimes more, rarely less, except from particular circumstance of position, viz. that of a small circular plain environed by mountains, destitute of wood. In such case, though the elevation may be not less than seven or eight hundred feet above the level of the sea, the heat, as measured by the thermometer, often exceeds that of the sea coast in actual degree; and, while higher in degree, the effect of its impression, as unaccompanied by the ventilation of the sea breeze, is greatly more distressing to animal life than exposure to heat of even a higher scale on the open beach. Positions on eminences on plains, or on the high margin of ravines which bound them are comparatively cool; but as exposed to currents of wind of varying temperature descending from the high interior mountains, the changes in temperature occur suddenly; the current of cold wind that strikes unexpectedly on the unguarded subject is often injurious to health.

As fever is apparently occasioned by causes of irritation; and, as the application of heat excites or exalts the irritable power of the habit throughout, the occurrence of febrile disease, of one form or other, may be reasonably expected to arise among persons who migrate from the temperate climate of Europe, or the higher latitudes of North-America, to tropical countries, particularly to the West-Indian islands. The fact corresponds with the expectation. Persons of sanguine temperament, of full habit, who feed grossly, who live in indolence, or who exert themselves by starts, rarely escape from an attack of fever during the first year of their residence in a tropical latitude. The fevers which occur under such circumstances are often of the most aggravated kind, concentrated and rapid in their course, more especially among troops thrown together in masses in barracks or transport ships. In crowded barracks or crowded ships, the heat of the climate is augmented artificially; and, though I do not contend that adventitious heat is the radical cause of fever, I cannot but believe in what is obvious, viz. that excess of heat tends to excite the febrile state, to influence the febrile form, to increase the violence of the symptoms, and to act in such manner as to retard the progress of recovery after disease has actually ceased. The fact is common and well ascertained. It is also ascertained by experience that, while the adventitious heat of the tropical climate proves a powerful exciting cause of fever to the

robust and vigorous European, it not unfrequently gives vigour and health to those who are torpid and valetudinary, especially to such as are in the decline of life.

The islands in the West-Indies, the medical topography of which has some relation to the different forms of the disease which makes the subject of this work, lie between the 20th and 10th degree of north latitude; the colonies on the main between the 6th and 7th. The islands, more especially connected with the subject under view, are Barbados, Antigua, St. Christopher, St. Eustatius, St. Martin, St. Thomas, Santa Cruz, Guadeloupe, Dominica, Martinico, St. Lucia, St. Vincent, Grenada, Tobago, Trinidad;—the colonies, Demerara, Berbice, and Surinam.—The islands alluded to are of various size; the greater number of them of an irregular surface; the interior of some of them of great elevation; and with the exception of Barbados, Antigua, Santa Cruz, St. Eustatius, still covered with woods. The mountains of the interior present themselves sometimes in ridge, sometimes in conical form. The ridges descend from the interior towards the sea with intervening ravines of various depth and breadth, viz. sometimes broad plains or valleys, sometimes narrow ravines, with steep precipitous banks—and streams of water of different magnitude, and generally of great velocity. The conical mountains, more or less regular in form, seem to rise upon a level but elevated surface. Thus sometimes, though conical in form, they are so clustered

Medical  
Topogra-  
phy.

with one another as to encircle a space of more or less extent, constituting a basin or bottom generally, but not always, of a loose or boggy soil.

The mountains of Guadeloupe, Dominica, St. Lucia, and St. Vincent are the highest in the chain of islands. The height of the highest, which is Dominica, is not known to me by measurement; as judged by the eye, it would not appear to be more than six thousand feet above the level of the sea—if so much. Of the others, few exceed three thousand; some not more than two. Besides ridges of mountain which, descending from the interior towards the sea, are of different declivity with intervening ravines or vallies of different extent, there are, in many of the larger islands, extensive plains, either level, or diversified by irregular risings and depressions, partly cleared and cultivated, partly covered with wood and still in a state of swamp or morass. Some of these plains are interior, the greater number are near the sea coast. The most of the islands, particularly the larger ones are abundantly supplied with water, the streams precipitated as torrents from the mountains in the season of rain; some of them are nearly destitute, viz. Antigua, Eustatius, Santa Cruz, St. Thomas, and even Barbados. The islands of the greatest elevation have ordinarily the greatest share of rain. The chain from Guadeloupe to Trinidad, particularly Dominica and St. Lucia, often suffers inconvenience from excess; Antigua, Barbados, and Santa Cruz often suffer from defect.



The colonies on the main, viz. Demerara and Berbice, are chiefly planted on the margin of the sea, or on the lower part of the rivers which open into it. The plantations in Surinam are on rivers and creeks, the borders of the sea being guarded by a belt of wood, supposed to be a security against the invasion of enemies. The cultivated lands in Demerara and Berbice, as lying at a lower level than high water mark, are necessarily exposed to inundation, and are in fact only preserved from it by means of dykes, canals, and sluices. The rise and fall of the tides, which is from twelve to fourteen feet at new and full moon, maintains more or less of movement in the moisture of the soil. Movement in the moisture of the soil, while essential to its productive quality, is no less necessary to its salubrity; and, as declivity towards the sea coast in the greater part of Dutch Guyana is said, by those who have measured, not to be more than one foot in one mile, stagnation, without the flux and reflux of tides, would be the consequence, and with stagnation insalubrity and unproductiveness, or total inutility. The seasons on the coast of Guyana are generally regular, divided into the seasons of greater or lesser rains. The rains are frequently excessive; sometimes they fail: the miseries of the colony are then great—mortality among man and beast enormous.

The cause of the fever termed endemic has the same base in all parts of the earth, modified by circumstances of locality in different districts of similar

Locality.

latitude, so as to present considerable diversity of appearance in its visible operation\*. On plains near the sea coast, near the embouchure of muddy rivers, near the banks of lagoons and other foul grounds, the type of fever, the product of this cause, is usually remittent, sometimes intermittent. It is generally regular in form, comparatively mild and tractable in the more open, extensive and sandy alluvial plains; it is irregular, often violent, in small con-

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\* It is worthy of remark that the forms of endemic disease are subject to changes at shorter or longer but unascertained periods, without any material change being visible in the circumstances of the locality or general qualities of the climate. In illustration of this fact, I take the opportunity to remark that intermittent fever, usually called ague and fever, did not once occur at Savanna-la-Mar, in Jamaica, between the years 1774 and 1778, in so far as my experience extended; the sick returns of the military, quartered at that station, furnish numerous instances of it in recent times. During the above period, the dry belly-ache, which was considered as a mode of febrile action, was by no means a rare occurrence at Savanna-la-Mar, and locked jaw was so frequent that every wound, scratch or accident was viewed with apprehension. These are, I believe, now rare; but I cannot speak with certainty on this subject. Dry belly-ache and locked jaw were rarely observed in St. Domingo, between 1796 and 1798. They were scarcely ever seen in the Windward and Leeward islands, between 1812 and 1815. Some instances of tetanic affection occurred, but they appeared, on dissection, to have arisen from, at least to have been connected with inflammation of the membranes which envelop the *medulla oblongata* and spinal marrow. Dry belly-ache occurs often, and locked jaw is not rare at the present time on the coasts of Dutch Guyana.

finer semicircular plains of foul swampy surface, whether on the sea coast or in the interior; it is often malignant on eminences that are in the centre of plains, or on the margin of the banks which bound them. The action of the morbid cause, instead of being what is commonly called febrile, is not unfrequently dysenteric; sometimes eruptive and ulcerative on dry, bare, rocky and hilly positions near the sea coast, or in positions where water flows with a rapid course. In the interior of most of the islands, at an elevation of five or six hundred feet above the level of the sea, amongst a series of mountainous ridges not directly exposed to currents of exhalations from swampy and low grounds, the form of disease is sometimes intermittent, sometimes remittent or continued, more generally dysenteric or ulcerative.—The dysenteric is more common in wet weather; the eruptive and ulcerative prevail more commonly in the dry season:—the dangers of febrile and dysenteric forms moreover ordinarily diminish in proportion to the elevation of the locality.

The sea coast of the islands is, for the most part, less healthy than the centre; diseases are not only more frequent, but more dangerous. The sea coast in the colonies of Dutch Guyana is, on the contrary, less unhealthy than the level interior. Fevers, though numerous on the coast, are usually remittent or intermittent;—and they are not dangerous—if properly treated. The dysenteric, and even the ulcerative form is there comparatively rare, except at particular times, viz. under the contingency

of long continued drought—when they are often epidemic and mortal. Beyond the river tides, and before the land attains that degree of elevation which gives a brisk current to water, the banks of the larger rivers in Guyana are, for the most part, unhealthy—destructive of European life to an extraordinary extent:—the form of disease cachectic, retrograde—such as may be termed liquescent.

Seasons.

Besides locality, viz. elevation and exposure, the revolutions of season, viz. summer and winter, spring and autumn; or, as they are more frequently termed, wet and dry, influence, in a material degree, the form and quantity of febrile diseases as they appear in the islands of the West-Indies. The months of January, February, and March are usually the most healthy months of the year. The disease during that period, as well as being less frequent, is ordinarily of a comparatively mild character; the type often such as is termed continued, the course regular, the crisis decided and final, unless as accompanied with forms of prominent local action which pervert the tendency of the course from its customary termination. In April and May, more especially where frequent and light showers of rain, with occasional and refreshing changes of temperature, produce what is termed pleasant weather, the dysenteric is usually the most prevailing form of acute disease—rarely violent in its symptoms, but frequently tedious and uncertain in its cure. Fevers of different type, generally continued, are common in the months of June and July. In

native subjects, or in those who have been long resident in a tropical climate, they are rarely violent or fatal. The crisis in such is, for the most part, regular and distinct; in strangers, particularly the plethoric, danger is considerable—the fatal course often precipitous. In August, September and October, the quantity of febrile disease increases in most of the intertropical islands, the type periodic—remittent or intermittent according to circumstances of locality or subject, the symptoms often violent—the course sometimes precipitous, sometimes tedious—the cure imperfect; the imperfect cure is by no means rare where the disease is left to pursue its own course, or where it is only feebly opposed by art. The gross quantity of sickness diminishes for the most part in the months of November and December; but, according to aspect and position of quarters, viz. position on eminences, on the margin of ravines, or in the gorge of vallies, exposed to currents of swamp exhalation impelled by the strong and comparatively cold winds that often prevail at this season of the year, the form of the disease, though properly speaking intermittent, is often anomalous, the character treacherous, the event not unfrequently fatal.

The seasons of the year in the West-Indies are distinguished by the appellation of wet and dry, rather than by that of summer and winter; they are further distinguished by short and long wet; short and long dry. The short wet season com-

mences in April and continues through May—the rains usually light; the long wet season commences in August, continues through September and October—the rains heavy, sometimes excessive. The diseases which occur during the wet season are numerous; but they are rarely violent or malignant. The number ordinarily decreases soon after the termination of the rains; but the character becomes malignant near foul and swampy grounds, especially where the position of the quarter is exposed to gusts or currents of chill and piercing winds descending from the mountains, and blowing through the gorge of ravines as through a funnel.—The exhalation, which is supposed to be the material cause of fever, is not visible to the acutest sight so as to be traced by the eye; but, as judged by effect, it appears to be capable of being wafted, in the common atmosphere, to the distance of several miles; and it appears moreover to acquire power from the adventitious impulse with which it strikes the subject. It is thus felt more strongly on heights or eminences, and particularly in gorges between mountains than on the open and level plain, even within a short distance of the source itself. Sickness is by many ascribed to fogs; but fogs in reality carry nothing with them that is injurious to health, farther than what simply belongs to cold and moisture. Rains are also reckoned injurious to health; but rain or descending moisture, if actually a cause of sickness, seems to be connected with the dysenteric

rather than the intermittent or remittent form, which is more directly the product of the exhalation which ascends from level surface, and stagnant water.

In dry weather, on a dry, rocky and barren soil, endemic fever usually appears under continued form. If the dry weather be of long continuance, the character assumed by the disease is frequently malignant and fatal, even among such as have been long resident in the country and as are held to be assimilated to the climate,—among European strangers, the concentrated form, known by the name of yellow fever, is then epidemic and often fatal as a plague. At other times, and under other modifications of dry weather that cannot be correctly discriminated by description, the morbid cause manifests itself by pustular eruptions on the extremities, degenerating into sores, sometimes into gangrenous ulcers which spread rapidly, destroy the membranes of the bone, and on many occasions the bone itself.

Besides locality and season of the year, the individual constitution of the subject sensibly modifies the action of the cause of the fever of the West-Indies. In native subjects, and those who have been long resident within the tropics, the forms of the endemic are comparatively regular, the symptoms mild, the fatality not materially higher than the ordinary fatality of fevers in Europe. In strangers, persons recently arrived from Europe or the higher latitudes of North-America, the symptoms are ordinarily violent, the mortality high, not lower than one in three, often not lower than one half, even

Circumstances of Subject.

more than one half. The robust and newly transplanted European, quartered in crowded barracks and attacked suddenly by fever of violent and open action, or action obscured, and as it were oppressed by quantity, dies for the most part within the fifth day; his barrack comrade, who has been some years in the country so as to be assimilated to climate, experiences no inconvenience, or experiences a disease of a comparatively slight and tractable kind terminating by crisis at a regular critical period. The general cause of sickness is obviously the same to both; the difference of effect obviously arises from the peculiarities of the subject. But while the vigorous and plethoric, as transplanted to the islands of the West-Indies, stands on the brink of destruction from the dangers of ardent fever, the feeble and valetudinary, as already hinted, often acquires vigour, so as to maintain a competent share of health in the midst of the hardest service of a West-Indian campaign.—When one form of disease prevails epidemically, others seem to be lost or embodied in the prevailing form. In this manner, diarrhea or habitual purging, sores or ulcers on the legs sometimes prevail epidemically, and, while they prevail, seem to be preventative of the formal explosion of general fever. When the diarrhea ceases, or when the ulcer heals, or begins to heal, fever of the worst form often makes its appearance.

Epidemic  
Influence.

There is generally a rising and falling among febrile diseases in number and intensity, also a



change in their forms according to the regular succession of seasons during the annual revolution; but besides this, there is occasionally an epidemic influence in the West-Indies, as well as in other countries which, while it multiplies disease to an incalculable extent, sometimes engrafts on it a feature of malignity which causes it to be regarded in the light of pestilence. The occurrence of such influence is not rare, if the records of medical history be accurate. One which occurred at Grenada, in the year 1793, was remarkable among others; or rather obtained remarkable notice, as being the subject of much intemperate controversy among medical writers. It appeared about the beginning of the month of March, which is the most healthy season of the year; and, as the form under which it appeared was not common, it was supposed to have been imported by a vessel which had just then arrived from the coast of Africa. The disease, as not of a common appearance, was in fact supposed to have been imported by the crew of the ship Hankey, and an opinion was moreover started and strenuously maintained that it was subsequently propagated by contagion through the medium of persons who had been on board of the ship, or who had been within the sphere of her infected atmosphere. The fact of primary importation and of subsequent propagation by personal communication has been controverted by many; and the opinion assumed, it must be confessed, does not appear to be established satisfactorily by any thing that has as yet been sub-

mitted to the public. After long experience of uncertainty on the head of medical fact, I abstain from saying positively that the importation, or the contagion of the Bulama fever was a phantom of the brain; but I cannot help saying that the circumstances of its history have so little analogy with what has occurred within my own observation, that I more than doubt of the correctness of the statement. The disease arose suddenly; it continued for a given time, and it disappeared at a time when the causes which contribute to forward the progress of contagion—had contagion been in the case, were in all their vigour. I do not presume to dictate to others on this head; but I think I may say that if things be examined without prepossession, the fever which appeared at Grenada in the year 1793 will be found to have more analogy with the epidemic, which is connected with unknown properties in the atmosphere, than with that form of disease which arises from distinct specific contagion. The history is illustrated by what occurred at St. Christopher, in the 25th regiment of foot in the year 1812.

Epidemic  
in the 25th  
Regiment.

The 25th regiment, like other British regiments, consisted of men of various ages and various habits; some old soldiers of six or seven years service in the West-Indies, some recruits recently arrived, some few sober, the majority drunkard to a proverb, the whole vigorous and athletic—the grenadiers and light infantry among the finest men that are to be seen in the ranks of the British army. The 25th regiment, as appears by the hospital returns, was

healthy in the month of January. The sick list increased in the month of February; and, in the month of March, the increase was so great, the violence so marked, and the mortality so alarming, that I considered it to be my duty to repair to the spot for the sake of better information than I could expect to obtain through simple official report. I arrived about the end of the month. The frequency of the disease, and the violence of the symptoms had not in the least abated at that time. The treatment was what is usually termed mercurial. It could not be said to have made any favourable impression on the course of the disease, for though it be true that those, on whom the mercury produced early salivation, frequently, or rather generally recovered; it is also true that mercury did not act in this manner in more than two cases out of three; and, where it did not so act, death was not averted. No one who saw the disease, or who attends to the circumstances of its history will, I believe, be disposed to doubt that it was yellow fever. It was in fact yellow fever in aggravated form. It made its appearance in the month of February, usually the most healthy month of the year. No grounds were found, on the most diligent enquiry, leading to a belief, or even suspicion that it arose from imported contagion. The first cases of it were observed among people quartered in a small and damp barrack without the barrier gate. The barrack was abandoned, but the disease did not cease. It not only continued, but extended to every bar-

rack within the walls of the garrison, acting almost indiscriminately upon men and officers, women and children, old and young,—those who were recently arrived from Europe, and those who had been five or six years, or more in a tropical climate,—those who had never experienced sickness, and those who had experienced the fever of the country oftener than once,—even some who had experienced it to such an extent of aggravation as to be regarded as genuine yellow fever. The symptoms were usually violent in the young and athletic recently arrived from Europe—the fatal course rapid, that is, within the fifth day; they were comparatively mild, the course protracted, that is, extended to seven, or even to ten days, in those who were advanced in years and who had been some time in the country—and generally in women and children. It was thus different in mode and duration; it was radically the same disease in all. The first cases of it occurred in the last days of February, some were observed so late as the last days in June; but the mode and the degree were not precisely the same at these different times. The disease in question had attained its highest point of intensity about the latter end of March; it continued in vigour during all the month of April; in the months of May and June, the form and character underwent some change; the symptoms were less violent—not less dangerous.

The 25th Regiment was removed from Brimstonehill, St. Christopher, to Beau Soliel in Gaudeloupe, in the beginning of May. The 15th, a corps

which had been long in the West-Indies, and which had suffered much from sickness on several occasions, arrived from Guadeloupe to occupy its place on Brimstone-hill. The sickness which had been so grievous to the 25th on Brimstone-hill, ceased immediately on its arrival at Guadeloupe. A serious sickness appeared among the soldiers of the 15th in less than a fortnight after they arrived at St. Christopher, and continued, though in a somewhat changed form and with mitigated force, until the last days in June, when it entirely disappeared.

I adduce this short history of epidemic influence, not as the only one which occurred during my last residence in the West-Indies; but as the one which best illustrates the epidemic which occurred at Grenada in the year 1793, and which, in so far as I am able to judge, had no better claim to a foreign origin and propagation by contact or near approach than that which is here alluded to as prevailing on Brimstone-hill, St. Christopher, in the year 1812. The health of the inhabitants, who lived in the plain, did not suffer during the rage of the sickness among the military who were quartered on the hill; but no person who resided on the hill, whether communicating with the garrison or not, could be said to be exempted from the influence of the epidemic. Several it is true escaped from an attack of formal disease, but no one can say through what precaution he escaped. It is not safe to say positively that the cause of a contagious fever was not introduced into the 25th regiment from a foreign

source in the year 1812; but the most rigid enquiries I was enabled to make on the spot led, as already said, to nothing on which even a prepossessed mind could found a suspicion that it was so. I do not give opinion as an oracle, and if any one be disposed to contend that the introduction of contagion was still possible though it could not be traced, I shall not attempt to argue with him. I assert only what I believe to be true on as good evidence as can be attained of a medical fact, viz. that propagation by personal contagion did not in any degree obtain on this occasion. I remained upon the hill nearly one month; I visited the hospital five or six times every day, with a view to ascertain every thing that related to the history of the disease and the manner of treating it, and I am free to say that I could not, in any one instance, substantiate the fact of propagation by contact, or even collect grounds for a probable suspicion that such propagation existed.

It is, I believe, denied by no person that a certain morbid influence, different from the common influence of weather and season as manifested at different periods of the annual revolution, acts epidemically on several occasions in the production of diseases, producing forms of greater mortality at one time, and of less at another. The existence of the influence is obvious; the nature of the material in which it consists is obscure. It cannot be affirmed whether it is negative of what stimulates the action of health, positive of what subverts it, or

sometimes the one, sometimes the other. But which ever it may be, the effect is manifested under different forms of action. The disease, the effect of this action, appears at different but uncertain intervals of time, travels in given tracts, adheres to given circles or to given points in a circle, impressing the idea that it owes its origin to exhalation from the earth, whether by the addition of what is noxious, or subtraction of what is useful ; and it finally ceases at a given time, sometimes unexpectedly, when subjects are within the circle who may be supposed to be susceptible of its action, and where no change is observed in the appreciable circumstances of the atmosphere, which serve to explain the fact of its disappearance. If diseases of direct specific or personal contagion, viz. small pox, measles, scarlet fever, or the fever of jails or hospitals arise under the prevalence of epidemic influence, the dangers are usually aggravated, the proportional mortality great, the facility of propagation augmented, independently of conditions of season and weather. Diseases of a distinct contagious nature spread with rapidity under certain unknown conditions of epidemic influence ; in others they scarcely, when artificially introduced, are able to support themselves, even with the help of every facility that may be given to the propagation ; and moreover, if I am not mistaken, the aptitude of propagation ceases for one species of contagion, while it remains for another. The nature of the aptitude is undefinable ; the existence of it is undeniable—and the existence of it is a fact

which furnishes the only explanation that can be given of an occurrence often observed, viz. that epidemic and even contagious fevers cease unexpectedly under a combination of external circumstances that might be supposed to give them activity.

Epidemic influence, as already observed, is fundamentally different from the common influence connected with the revolution of the seasons; it is at the same time true that it very often assumes the feature of morbid action which belongs to the season of the year in which it happens to occur. The fact is an important one; and in illustration of it, I take the opportunity to state, that the forms of diseased action were different at different periods, during the total continuance of the epidemic which prevailed on Brimstone-hill, in the year 1812. In the months of March and April, when the weather was dry, the heat great during the day, the cold considerable during the night, the morbid action was usually such as is termed inflammatory, sometimes suppurative, sometimes in such excess as to be gangrenous,—the stomach and head the organs principally affected; in May and June, when the weather was mild, with moderate showers of rain, the symptoms were less violent in appearance, the mode of action congestive, characterized by adhesion between contiguous parts and effusion of watery fluid into cavities—the head and stomach the organs which principally suffered.—Such is the fact of the history of the epidemic of 1812, and, in further support of the doctrine here inculcated, I may add that an epidemic pre-



vailed in the same place, in the same corps, in the months of June and July, 1811. No dissections were made of those who died in that year, but the histories of the disease, which are preserved in case-books sufficiently demonstrate that various forms of perverted action obtained among the organs contained in the abdominal cavity, whether excretive or congestive, furnishing proof that circumstances of season, though they do not command, modify, in no inconsiderable degree, the form of the existing action.—The forms now noticed are forms of general febrile action. Besides these, the febrile act is sometimes more directly local, viz. pneumonic, dysenteric, ophthalmic, eruptive or pustular, sometimes gangrenously explosive, rapidly degenerating into foul and sloughing ulcers on the extremities, which spread and speedily destroy the substance of the solid parts,—sometimes to great extent as modified by influence of season and locality.\*

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\* No one will pretend to deny that the epidemic influence, which produces particular forms of disease, depends upon the condition of the atmosphere; and many, it is presumed, will be disposed to admit that that atmosphere is actually the product of the earth produced by certain forms of chemical operation that obtain in the interior or near the surface. If this be admitted, the material, which constitutes the supply for the chemical process, must be supposed to be present in every part of the earth, and to move or circulate through every part in channels that, in a certain sense of the word, may be termed organic. A close consideration of the history of things gives probability to the opinion; and, if the opinion be admitted to be

Contagion  
or Non-  
contagion.

The limits of this work do not admit of discussion on the subject of the contagion or non-contagion of the concentrated endemic or yellow fever of the West-Indies; but, as it will not be expected that a person whose opportunities of observation have been extensive should pass the question without notice, I shall state my opinion unreservedly, and in as few words as possible. The judging the question aright is of some consequence to the interests of the community, and it particularly concerns the interests of the British army. But there is so much of prepossession at the present time on one part and on the other, that it is not easy to separate the fact from the opinion. I shall therefore, without entering into controversy, simply state what I have seen, and leave the reader to form his own conclusion. The question has been treated as a party question, and I am not desirous of making converts to either. The subject is important; but, as it appears to myself, the history has not as yet been traced with sufficient attention; or the question of opinion when discussed, has not been discussed with sufficient temper.

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true, the history of epidemic diseases is brought one step nearer to a basis of consistence. The epidemic influence may offend by something positively irritative, and, as such, is perverted action; or by something defective of vital energy that, not opposing, seems to facilitate perversion. In either case, disease is the consequence; and in the latter, where the cause is augmented by artificial aggregation of subject, the effect is sudden and destructive as the breath of pestilence.

The dread of personal infection from the common endemic, even from the concentrated form termed yellow fever, did not, in so far as I recollect, operate on the practitioners of Jamaica at the time I resided in that island, which was from 1774 to 1778. This I remember perfectly, in so far as concerns myself, that I approached the bed-side of the sick without apprehension, and opened the bodies of those who died of the worst forms of disease without suspicion that I incurred danger by so doing. I had not then, I am ready to admit, considered the question with care. I might be ignorant; but I carried with me, when I left Jamaica, no impression that the yellow fever was a contagious disease. That was an impression only; it is no argument, and I found no opinion upon it.

A military force was collected in Ireland, and assembled at the Cove of Cork in the latter end of the year 1795, for reinforcement of the army serving in St. Domingo. Contagious fever predominated in the British army at most periods of the war in 1793. The seeds of it were scattered generally, and they existed in the greater number of the corps which assembled at Cork on this occasion. They were brought to maturity, and multiplied by circumstances, connected with weather and aggregation of subject, to such a state of aggravation that sickness spread rapidly among those who arrived at the rendezvous in perfect health. The disease became general, and assumed a formidable aspect in most of the corps after their embarkation. It was

conveyed to the West-Indies by some of them in a state of great concentration, and was fatal to a considerable extent both on the passage and in the hospitals at Barbados; but I have not obtained any evidence that it spread to the healthy by communication, either in hospital, or in barracks, after the troops were disembarked. It fell within the sphere of my observation, on this occasion, to note the mode in which fever, from a contagious source, is influenced by climate and other circumstances connected with the situation of the subject. The disease, though derived from contagion, was observed to terminate critically at a certain period when transferred to the tropical climate: relapse was frequent; the symptoms in relapse were sometimes violent, but the termination was rarely fatal. The duration of the disease, as a disease in relapse, was ordinarily short. It seldom exceeded the third or fifth day; but, though terminated, it was prone to recur at intervals of eight days or a fortnight, generally with diminished violence in every succeeding recurrence, somewhat in the manner as if an accumulated cause of disease had gone off by repeated explosions until it finally expended itself. From the fact here adduced, which as manifested on a large scale, may be supposed to have a foundation in the nature of things, it may be fairly inferred that the cause of the contagious fever of jails, hospitals, and crowded quarters gradually dissipates and soon disappears under tropical heat, thorough ventilation, personal ablutions, and fre-

quent change of apparel. The inference, as drawn from the history of the St. Domingo expedition, seems to myself to be well supported; and I add that fever of a personally contagious nature was brought to Barbados on several occasions by the detachments of troops which arrived at that island between the years 1812 and June 1815, inclusive. The troops were inspected on their arrival in Carlisle Bay. Those who were sick at the time were sent to the hospital; those who were suspected of having received the seeds of disease, as having associated with sick comrades, or having breathed a tainted air in the 'tween decks of a crowded ship, were disembarked and placed in barracks. There were few of those who arrived in sickly ships who did not experience fever in some degree or other after disembarkation; but of those sent to barracks, though few escaped from sickness, no one died and no sickness was communicated by them to other troops in garrison. Of those received into hospital as sick from on board, several died on the first, second, or third day after admission; but though the disease was in its own nature contagious, it was not communicated to the orderlies and hospital attendants in any one instance.—I may add that this important fever was different in its aspect from the ordinary fever of the country. The difference is cognizable by a peculiar glistening in the eye, by certain shades of expression in the countenance, and by circumstances connected with the conditions of the skin. Characters of difference

actually existed ; in further support of it, they were here visible and might be read by the discerning observer ; they were so delicate, or so combined, that they cannot be separated so as to be rightly comprehended in verbal description.

From the facts now detailed, and they were too often repeated to be regarded as equivocal even by the prejudiced, it is not possible to refuse assent to the inference that there is something in the temperature of tropical climates, in the thorough ventilation of tropical houses, in the routines of purification and personal cleanliness that usually obtain among troops in hot countries, which strongly counteracts the propagation of certain forms of contagious disease. The specific contagions of visible product, viz. small pox, measles, &c. spread from person to person with the same activity in the West-Indies as they do in Europe ; but the contagion of the jail, or artificially infectious fever, which is supposed to consist in something secreted in invisible form from a diseased animal body, and which is believed, on good grounds of reasoning, to be aggregated or condensed in a stagnant state of the air, so as to acquire multiplied virulence by aggregation, is dissipated, diffused and attenuated by the heat and ventilation of a tropical climate, in such manner that it ceases to act, at least to act with injurious effect, even on those who are naturally irritable and predisposed to its action. If this be so, and the truth of it rests on the best forms of medical evidence, we cannot well understand how the cause of a fever

which had been generated on board of ship while lying on the coast of Africa, or while on its passage from Africa to the West-Indies, should multiply itself so extensively as it would appear to have done, and so contrary to the rule of multiplication that obtains among other forms of contagions. No person, it is presumed, is so void of understanding as to believe that the cause of endemic fever is imported in the hold of a ship, unless the hold be filled with the constituent parts of a swamp; it is proved beyond controversy that it is not transferrable to the persons or clothes of those who navigate. The Bulama fever, as it is called, was evidently a violent and a fatal disease; but it does not carry in its history any marks of specific distinction from all other diseases. Innumerable similar instances, in so far as opinion can be formed of similarity from verbal description, have appeared at intervals ever since the West-Indies were first visited by Europeans,—and they still appear without importation or suspicion of importation from a foreign source. I abstain from giving opinion on what I have not witnessed with my own eye, and shall leave every one to form his own conclusion respecting the propagation of the Bulama fever to the different islands in the West-Indies; but I am warranted to say—and my official situation gave me the opportunity of knowing the truth, that no contagious fever was imported into St. Domingo from the year 1796 to the year 1798, exclusive of the fever which the reinforcement of 1796 brought with it,—unless a fever which prevailed in the 2nd regi-

ment of the Irish brigade, at the time it arrived from Jamaica, be thought to belong to that class. The fever which was imported from Ireland in 1796 existed in form but was so much mitigated by the time the troops arrived at St. Domingo that, though relapses still occurred, little mortality could be assigned to it in that country. The fever which prevailed among the soldiers of the second regiment of the Irish brigade, there is reason to believe was a seasoning fever, endemic in its origin. It was aggravated, and I readily admit changed, by the confined air of transport ships during a tedious passage, so as to resemble externally the common jail or hospital fever. But I may add that, if the contagious property was actually engrafted upon it, it was not communicated from it to the troops in garrison at Port-au-Prince where the corps arrived, nor was the disease communicated by those actually sick to the attendants of the hospitals into which they were received, though many were in a deplorable condition, the corps having lost about thirty men on the passage, and having a hundred and twenty still on the sick list when it arrived at Port-au-Prince\*.

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\* In proof of the non-existence of contagion, or the difficulty of propagation in tropical climates, I myself stood in the bathing room in the midst of dirty clothing and squalid forms of diseased persons covered with impurities until the greater number passed through the various necessary processes of purification, experiencing no attack of fever, nor did any of the servants who performed the more disagreeable and apparently dangerous parts of the labour experience any.



I hold it to be proved by the histories here alluded to that fevers, except those specifically contagious, rarely propagate from person to person in tropical climates, but I do not deny the possibility of the contingency. If men, either in health or in sickness, be crowded into damp and ill ventilated apartments, particularly in bomb proofs, as sometimes happens in time of war from conditions of service, or in time of peace from want of barrack room, the air is contaminated by the emanations of a crowd of inhabitants, while the simple heat of climate, without thorough ventilation, is not sufficient to prevent the aggregation of the noxious material thus secreted from the bodies of subjects, either directly diseased, or, living under such artificial constraint as produces a condition analogous to disease. As every series of parts in the organic system is liable to be acted on by a general cause of febrile irritation, I do not know that it is repugnant to the laws of animal economy that the propagating process should arise as a consequence of general irritation; and, thus arising, should contingently generate a material which, under certain circumstances of aptitude, possesses the power of self propagation or continued multiplication. It is perhaps somewhat in this manner that gastric fever, which is common in the autumnal season, particularly in protracted campaigns in temperate climates, though originating radically from an endemic cause, either primarily assumes the mode of action which generates the contagious material, or acquires it secondarily by a combination of arti-

ficial circumstances to which the individual is exposed. It is known, from undeniable testimonies of military history, that the camp or gastric fever of autumn is readily converted into or rather with difficulty prevented from degenerating into the hospital or personally infectious fever of winter. The fact is proved: we may doubt and conjecture concerning the mode through which the effect is produced. This much is obvious, that the principal action of the autumnal fever is exerted on the gastric system, and often presumptively on a series of serous vessels of the least sensible excretion. The febrile act is transferrable; and it is contingently transferred to the corresponding series of the excretories of the skin, the excretion contaminating the air, and through some unknown process of animalization, assuming a quality which has a tendency to multiply itself, and which actually multiplies itself to great extent.

The contagious fever of jails and hospitals is ordinarily a disease of a slow course. We cannot say at what point in the progress of the diseased course, the contagious material, which is the product of the diseased action, attains maturity or efficient activity,—but we cannot, according to analogy in other things, suppose it to be sooner than the ordinary period of the fatal crisis of the yellow fever. The yellow fever, when it terminates fatally, usually terminates within the fifth day—the progressive febrile act within the third. It is therefore evident that the contagious material, whatever its nature may be, must necessarily assume its form and be

matured into efficiency before the third ; for after the third, the process is retrograde to disorganization, where no peculiar creative act exists, or can be supposed to have existence. It may be farther assumed as a fact that the contagious material of fever, whatever it may be, attaches itself to the serous or excrementitious part of the blood, in as much as it is a material which solicits expulsion. It acts on colourless vessels ; the product of the act is excretive, necessarily external, but subtile and invisible. The cause of yellow fever, whatever it may be, acts most commonly on vessels which contain red blood, or fibrine ; the product is internal, gross and visible, viz. suppurative inflammation, adhesive inflammation, stagnation of blood in the veins, and gangrene direct. The process of multiplying the contagious material by the laws of organic life must of necessity be supposed to be a regular process of creation. The mode of action of the yellow fever is ordinarily tumultuous, irregular, directly destructive of organic structure, so as to occasion death speedily, and as it were prematurely ; hence it is reasonable to conclude that the process generative of contagion, if actually moved by the stimulation of a contagious material, is impeded, perverted and annulled by violence ; consequently the propagation of the disease fails through the adventitious circumstances connected with the soil in which the seed has been actually planted.—The rapidity of the process, through which the contagious material of the yellow fever must necessarily be multiplied in the ordinary course

of that disease, seems to contradict the ordinary laws of animal organism in producing contagions ; and therefore, if there were no other cause to raise a doubt on the subject than this simple fact, that fact and the reason of it leave the opinion of propagation, by personal communication, on very equivocal ground.

I think I am warranted to say that the Bulama or yellow fever, as it is termed, was not imported into St. Domingo between the month of May, 1796, and the same month of the year 1798 ; while I am also warranted to say that the returns of the hospital show that a disease of concentrated force and great mortality prevailed among the troops stationed in that island during that interval. No contagious fever was imported, or supposed to be imported into the Windward or Leeward islands, except from England, from the beginning of 1812 until June 1815 ; yet the prevailing sickness was sometimes severe, the form aggravated—such as no one could refuse to be entitled to the name of yellow fever. It was not in my power, with every attention given to the subject, to trace the propagation of fever from one person to another, either in St. Domingo, or in the Windward and Leeward islands, notwithstanding that sickness was sometimes epidemic, and the hospitals much crowded ; but I do not therefore pretend to say that diseases which arise from epidemic, or even from common causes, and which are not in their own nature contagious, may not be so changed by artificial circumstances as to assume a process

which actually generates the matter of contagion. Of this there is some real proof, with a great deal that is superficial and deceptive.

In elucidation of this opinion, I take the opportunity to observe that a febrile disease not unfrequently makes its appearance among European troops transported to the West-Indies, sometimes in two, sometimes in three, and sometimes not until after six, eighteen months or more from the time of their arrival. It occurs without suspicion of imported contagion; but it often proceeds through different corps, or different parts of the same corps, by such modes of succession as if its propagation actually depended on personal communication. In this manner, of two corps, which have arrived in a tropical climate at the same time and which are quartered in contiguous barracks, or encamped on contiguous ground, one experiences concentrated fever, the other remains in health, or experiences sickness in a mild form. The difference alluded to, as affecting corps, descends to different companies of the same corps. The fact is notorious and not unimportant in its consequences. It impresses the conviction that there is a secret and unappreciable correspondence between the habit of certain subjects and certain constitutions of atmosphere which may be termed aptitude; an admission of the existence of which affords the only explanation that can be given of the fact of seeming or deceptive contagions so often observed among troops recently transferred to tropical climates. The aptitude diminishes by resi-

dence ; and it is absorbed or destroyed under the changes which take place during the action of a severe febrile disease. It is termed 'seasoning' or assimilation to climate ; but the assimilation here alluded to, though important as a security against the most concentrated forms of fever, is never so perfect that a change from one island to another, though nearly of the same latitude, does not affect the health more or less so as to occasion increase of the sick list. Besides the general and inexplicable aptitude now adverted to, there exist various adventitious causes, the operation of which so much affects the aspect of disease as to give, on some occasions, the appearance of contagious influence where none in reality exists. The more important of these are indolence and rest after a series of regular and active exercises ; full living or excess after abstinence and sobriety ; transition to the heated and impure air of a crowded ship or crowded barrack after ranging at freedom in the pure air of woods and mountains ; even sometimes the opposite.—Febrile disease, as it occurs in the newly imported European exposed to the influence of the adventitious causes here alluded to, is often formidable in its aspect and dangerous in its tendency,—the action sometimes irritated and tumultuous, sometimes oppressed and diminished:—in the heated air of a crowded ship, sometimes gangrenous and fatal as a pestilence.

I have said more than I intended, and more perhaps than is relevant, on the importation and contagion of the disease termed yellow fever, as exem-

plified in my own experience in the islands of the West-Indies. A disease, somewhat similar in appearance to the fever of the intertropical regions, was observed at different intervals between the years 1793 and 1805, at several of the sea-port towns on the continent of North-America. A disease of similar character has also latterly appeared in different towns on the sea coasts of Spain; and among others, at Gibraltar which is garrisoned by part of the British army. The occurrence of the disease at Gibraltar occasioned considerable sensation in Great Britain. The fears were awakened to the chances of importation; and, for a long time, nothing was attempted by medical men either to confirm or remove the fears. The subject has at last obtained formal discussion; but, though fully and formally discussed, it does not appear as yet to be satisfactorily settled. The higher of the official authorities, who have written on the Gibraltar fever, maintain that the origin was foreign—the character contagious; others of less official authority, but not necessarily of less credibility, doubt or deny the fact. It is difficult for a person who has not been on the spot to come to a safe conclusion. Affidavits and official reports of importation and subsequent propagation by contact or near approach have been made with great solemnity. They are easily made, and they often obtain credence; but they are not authentic evidence. The opinion of the importation and contagiousness of the yellow fever of North America was supported by reports and affidavits of

North America and Gibraltar.

formality, as well as that of Gibraltar; even belief in the accuracy of the opinion obtained currency for a time. The American physicians, after the first alarm was over, examined the question without prepossession as became men of science, and ventured to pass judgment in the case according to the uniform and established laws of nature—not the reports of ignorant and prejudiced men. They saw the truth, abjured their error with candour and manliness; and the State, which had a philosopher for its president, opened its eyes to the conviction of truth—and abrogated the rigid law of quarantine. We do not look to the same result, even, if the same conviction should be produced among the scientific that the yellow fever of Gibraltar is as void of contagion as the yellow fever of North-America and the West-Indies. The quarantine law is an engine of the state; and, like other of the ordinances of power, it is so sacred that to attempt to prove that it has been made without cause, or that it is maintained contrary to reason, would be labour lost,—if not penalty.

The history of the fever which occurred at Gibraltar is extremely embarrassed, so obscured by what has been said and written upon it, that it is difficult to form a distinct idea upon the subject. In such uncertainty, I do not presume to offer positive opinion, and only add that as the disease, in its different visits, usually appeared near a given time, and continued for a given time only, it has more analogy with what belongs to epidemic influence



than to individual or imported contagion. The Gibraltar fever spread rapidly and extensively in the manner of pestilence which depends on a general condition of the air; diseases of imported contagion necessarily spread slowly and limitedly as communicated from person to person only. It is obvious to every man's common sense that epidemics are not contagious in their origin, it is not against the law of nature that they become so in their ulterior course. It will not be denied, for it is proved by good evidence, that general infection of the air may be so multiplied by aggregation of subject or other artificial cause as to multiply or aggregate the noxious material, whatever it may be, and to facilitate its operation in such manner as to give at first sight an appearance of contagious propagation without actual contagion; but I may I believe further add that, under epidemic influence, the accumulation of sick persons in confined and ill ventilated apartments has in some instances actually produced personal infection, or engrafted contagion on the epidemic stock, thereby confusing, or even superseding the original epidemic character existing at the time. Whether this happened at Gibraltar or not, does not appear to be determined by distinct evidence. That the attendants on the sick suffered, unless they suffered in a decidedly greater proportion than the rest of the garrison, is not conclusive of the existence of personal contagion. If clothes, worn by the sick, or placed near the sick, were conveyed to distant places; and, if they there com-

Epidemics  
not conta-  
gious.

municated disease to persons in health, no one would presume to refuse the evidence ; but this, in so far as I have seen, does not appear to have been said, at least to have been ascertained.

The exemption of persons placed in quarantine furnishes a strong argument in support of the popular opinion of the contagious nature of fever of Gibraltar and other parts of the coast of Spain. The case is specious, but not decisive in proof of the fact assumed. It admits of explanations which, if they do not absolve from the opinion, considerably weaken its force. It is obvious that persons who are placed in quarantine, while destined to live within a circle of atmosphere that comparatively varies little in temperature, are at the same time enjoined to live after a regular and cautious manner. They live under regulation, and, as such, they are little exposed to contingencies which, if they be not in themselves the cause of fever, are often the obvious cause of its explosion. It is a fact of common notoriety that persons who live in a still and undisturbed, but infected atmosphere, often remain exempt from the attacks of formal disease ; while transition from that infected source to purer air of a different temperature rarely fails to manifest some form or other of morbid explosion. The phenomenon is often exemplified in withdrawing troops from infected quarters to the open country ; or from sultry plains to mountainous districts. The sick list is usually increased on such occasions, though the subject be actually removed from the source of

the sickness; it is still more decidedly increased, where the change is made from the mountainous district to the sultry plain; or from the open plain to the crowded barrack, or crowded transport ship: in that case sickness sometimes explodes as if by electric influence. This is the fact, but not the whole of the fact which relates to observances of quarantine. Persons placed in quarantine, besides the still mode of life to which they are obliged to adhere, and the correct regimen which they are enjoined to follow, are, for the most part, destined to inhabit apartments where the air is artificially different from the common atmosphere of the environ. If it be supposed that the earth gives out the exhalation which is the cause of fever,—and there scarcely can be another supposition under the reign of epidemic influence, it is evident that the artificial covering which is thrown upon the earth's surface by means of floors and pavements suppresses direct exhalation; while the walls and other interpositions, which cut off the quarantine quarter from communication, stop the course, at least diminish the impulse of the atmospheric influence which may have passed over the source of infection. As noxious exhalation can scarcely be supposed to rise through the floors and pavements of the quarantine quarter, so the walls and other interpositions, by which it is secluded from the neighbourhood, while they interrupt the progress of the lower currents of air, imply a necessity of air being supplied from the higher region—more diluted and more pure than

that which is near the earth. This is obvious enough; and with this and other facts which bear upon the subject fairly considered, it seems reasonable to conclude that the observance of the quarantine law contributes to prevent the spreading of sickness, not by precluding the chances of contact with persons supposed to be infected, but by precluding chances of vicissitude in atmospheric temperature, and more especially by impeding the direct progress of currents of air that have issued from, or swept over the noxious sources of epidemic infection.

High Temperature.

It has been maintained by some recent writers that the disease termed yellow fever does not arise, or does not propagate unless under a high degree of atmospheric heat. The assumption is gratuitous, not supported by the history of the fact. The disease termed yellow fever appears among the troops in the West-Indies, sometimes in seasons of a generally high temperature, sometimes in seasons where the general temperature is moderate, considered as the temperature of a tropical climate. But, that the production and propagation of this form of disease is not radically dependent on high degrees of atmospheric temperature, is decidedly proved by the fact stated by Dr. Rush that the occurrence of yellow fever was not rare at Philadelphia in the year 1793, when the thermometer was under sixty, and it is further proved by what is found in Dr. Pym's book, viz. that the disease so denominated occurred at Gibraltar, in the month of November, when the heat was under seventy.

It has been long supposed, and it has lately been pretended to be proved, that persons who have sustained one attack of yellow fever are exempted from all apprehension of a second. If black vomiting be considered as the diagnostic of the disease, the assertion cannot be easily disproved; if yellowness, it is not founded. There are numbers of persons, within the sphere of my own observation, who have been yellow and dangerously ill oftener than once during their residence in the West-Indies, particularly under migration from one island to another. The exemption contended for, I think, I am warranted to say is not absolute; but, I willingly admit what I know to be true, viz. that there is something in residence, and in changes induced by concentrated fever which renders the habit comparatively little susceptible of the form of disease which terminates with black vomiting, and which, in pre-eminence, is called yellow fever. There is no absolute preclusion; nor is the opinion, that the disease in question is of a peculiar or specific nature, established by any thing yet submitted to the public, however confidently that opinion may have been given. Re-infection.

## CHAPTER I.

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*Characters of Constitutional Temperament which exist antecedently to the formal Occurrence of Fever, and which, to a certain extent, modify the subsequent Action of the Disease.*

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**T**HE human body consists of a series of organic structures of various form and different sensibility, stimulated to action by the impulse of variously modified circulating fluids. The action of the fluid on the solid organic structure, and the reaction of the solid structure on the fluid may be considered as reciprocal; and, it may farther be considered as a fact of primary importance to the practical physician, that it is in the justly balanced reciprocity of this action and reaction through all parts of the system that the efficiency of purpose, or health of the individual actually consists. In any given structure or fabric that is purely mechanical, the action of the machine is limited to one line of movement. It is forwards and backwards, and backwards and forwards in precisely the same channel. In the animal

body, the channel of perfect movement is one also ; but there is a latitude in the circle of movement which admits of different degrees of energy in the act, and which embraces peculiarities in the mode, of such diversity, as to obtain the name of constitution, habit or temperament.

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The human body consists, as is commonly known, of solid and fluid parts. The blood is the source of the fluid. It may perhaps be justly considered as the rudiment of the whole animal fabric. It stimulates the organic structure to action ; and, exclusive of the material of nutrition, it supplies the material through which organs exercise and execute official function. The blood, as circulating in the blood vessels of a perfect and healthy animal, presents itself as a homogeneous mass ; and it moreover presents itself as apparently preserved in a state of homogeneity by the impulse of motion communicated to it through the organs which maintain the circulation. When the influence of the moving-power is withdrawn, the blood separates into different parts, exerting, with different degrees of energy, an innate organizing power in which life or vitality may be thought to consist. In so far as observation can warrant the forming of opinion, the blood is the first part of the animal body which lives, and the last part which dies. When possessed of vitality it stimulates all forms of organic structure to the execution of function. The principle of vitality through which this purpose is effected appears to be adventitious, received from the atmosphere in the act of

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inspiration ; if withheld, diminished, or corrupted, through whatever means the effect is produced, the impulse of blood neither stimulates the organic structure to effective action, nor does the blood organize itself into constituent parts when it is removed from the body.

When the blood is removed from the body and suffered to rest, it separates itself into different parts, viz. solid and fluid. In the solid part, a mass, consisting of a red coloured substance termed crassamentum, and a pale or colourless substance termed fibrine or coagulated lymph, is ordinarily observed. In the watery or serous part, the substance is diversified ; but the appearances are so variable, and so obscured by mixture, that they cannot be discriminated by mere inspection so as to be intelligibly described. The different constituent parts of the blood are of different proportions in the same quantity of blood taken from different subjects, or from the same subject under different conditions of habit ; and, as different, it exerts its organizing power with different degrees of activity in different cases after it is abstracted,—sometimes with great activity, indicating a superabundance of the organizing principle which is demonstrative of life ; sometimes with sluggishness and inactivity, indicating a feeble condition of the living principle—on some occasions almost its total extinction.

A certain condition of body, termed constitution or temperament, is often alluded to in the writings of practical physicians. The condition is in fact



often supposed by them to influence the character of febrile action, and thus to be of important consideration whether with a view to the history or cure of the disease. I am aware of its importance; and preliminary to a history of fever I think it proper to give my opinion on the subject. I employ the term temperament in preference to that of constitution. The temperament appears to have its basis in the fluid parts of the animal fabric, exhibiting its character in the conditions of the principal constituent parts of the sanguineous mass, viz. crassamentum, fibrine or serum, into which it spontaneously separates when it is suffered to rest. The mixture or temperament of habit is just or perfect when no excess is observed in any one of the constituent parts over another, and it then has no denomination. It obtains an adjunct term, viz. sanguine, phlegmatic (more properly lymphous), and serous, when excess or tendency to excess is perceived in any one of these parts.

The temperament of the individual may be in some degree innate, communicated to the first rudiment of the frame, and, as such, to a certain degree hereditary; or it may be acquired by habits of life, particular kinds of diet, &c. and, as such, factitious and easily changed. It is designated by predominance, or peculiarity of condition in the different parts of the blood; but only in strict propriety entitled to the name of temperament where the condition extends to the whole of the circulating mass. The sanguine, the phlegmatic, and

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the serous temperaments are frequently alluded to in the writings of physicians; also the bilious, the catarrhal, and the nervous. The sanguine, the phlegmatic or lymphous, and the serous excess constitute general temperaments. The bilious and catarrhal are local, depending on partial organic derangement, and therefore not in strict propriety entitled to bear the appellation of temperament. The nervous is an adjunct to every one,—varying and without stability; the condition in the circulating fluid on which changes depend cannot be defined with certainty. According to the view which I have formed on this subject, temperament is a general condition of the whole circulating mass of fluids. This, I believe, must be admitted as truth and a basis of reasoning, and it further may be added that the act of movement in the circulating mass is marked by general characters, viz. by increased action, or tendency to increased action on a particular base, producing a new or diseased material of different form and modification; or, by movements deficient in customary activity, even retrograde, tending towards dissolution of the organic structure, and terminating in local or general death.

Sanguine.

I. The sanguine temperament, or tendency to it, is generally, but not always, accompanied with the external sign of a florid complexion—sometimes fine and delicate, sometimes coarse, ruddy and ardent. The sanguine temperament may be, to a certain degree, innate and constitutional; or it may be contingent, the effect of periodical revolution in

seasons, mode of life, and other still more accidental causes. There is one form of it, connected with a high degree of animal heat, sensibility, animation, and energy of animal action; another with moderate, or rather weak superficial heat, excessive sensibility, feeble expression of animal action, and facility to retrograde or dissolution. The blood, as drawn from a vein is of a deep red and of high temperature—coagulating firmly and often in a short time in the one; it is florid or bright, of moderate temperature, coagulating loosely, and comparatively slowly in the other. The tendency to, or actual excess in the temperament termed sanguine, is not confined to particular seasons exclusively. The first of the forms alluded to in this place is, notwithstanding, most common in the latter part of winter, in spring and the early part of summer, in cool and in dry weather. It is chiefly to be found among persons who live in mountainous and dry countries, who live temperately, who labour in the field, or who otherwise spend much of their time under exercise in the open air. It is consistent with the highest state of health, not always the most secure; for, as connected with a high degree of constitutional sensibility, it is excited into a state of febrile irritation subversive of health, by comparatively slight causes. The febrile act, where a general febrile cause is applied to a subject who has a tendency to, or who possesses what is termed sanguine temperament in the slighter perceptible degree, is animated and regular; the febrile process suppurative; the

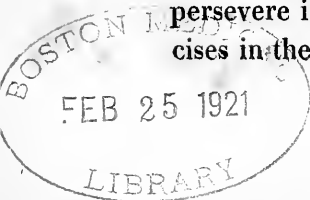
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termination by distinct crisis, viz. sweat and hypostatic urine. Where the febrile act is accompanied with prominent action locally, local suppuration is the usual consequence. Where the temperament is in excess, however that excess may have been produced, the regular suppurative process is impeded, or only imperfectly developed, in so much that, after tumultuous and regular excitement, stagnation or gangrene, generally or locally is the more usual mode of termination. The second form of the sanguine temperament is observed more frequently in warm and damp weather than in the opposite circumstances. The febrile act, though apparently much excited, is deficient in force and energy; the course readily assumes the retrograde—the termination is distinguished by solution or liquescence.

Phlegmatic or Lymphous.

The condition of temperament commonly termed phlegmatic, but which as already said, might with more propriety be termed lymphous, in as much as the coagulable lymph is conspicuously predominant, is not upon the whole less frequent than the sanguine. It prevails generally in champaign and swampy countries, near inland lakes and on the banks of fresh water rivers. It is more common in damp and foggy weather than at other times, and it is more particularly conspicuous among those who live on grosser farinaceous aliment, and who are at the same time indisposed to assume, or to persevere in courses of animating and active exercises in the open air. The presence of the higher



degree of it is known by a soft, smooth, inelastic state of the skin, deficient in warmth and sensibility, by a countenance torpid and heavy, pale, pasty, and often bloated,—by a pearly white appearance of the eye—dull and inanimate. The tongue is usually clean, but less red than natural, sometimes foul and clay coloured. When blood is drawn from the veins, the temperature as judged by sensation is comparatively low, the colour rarely bright or florid. The mass separates slowly into constituent parts, the surface remaining plain, smooth or jelly-like, the colour dingy pale or sky-blue. When a cause of febrile irritation is applied to a subject characterized by this form of temperament, the movements of the subsequent act are slow as febrile movements; the crisis is ordinarily imperfect, oftener conversion than crisis, viz. congestion, or apposition of adventitious matter in the cellular membrane of organic structures—in the abdominal more frequently than others. This constitutes the acute form of phlegmatic fever; but besides this, which is the more acute and the more customary, the febrile course excites, on some occasions, a morbid form of action of such duration and character as to constitute a constitutional malady which usually goes by the name of *cachexy*. The cachectic form of fever is common in certain countries, or in particular districts of country. Its character is peculiar; the colouring matter of the muscular flesh expelled or absorbed by a process of an unknown nature, is replaced by the apposition of coagulated lymph or

CHAP. I.  fibrine to such extent as to establish a general or local form of organized congestion and new growth in various parts of the body, principally manifested in the various expansions of the cellular membrane.

Interchange  
of Serous  
Tempera-  
ment.

The sanguine and phlegmatic temperaments, which consist in excess, or tendency to excess in the just law of mixture, seem often to be combined, at least to interchange with each other in the course of the disease. This is frequently observed in the incipient temperament, rarely in the temperament that is fully established or confirmed. Where such combination or interchange takes place in any given case, the blood, which is drawn from the veins, forms into a firm mass in the vessel into which it is received; the surface of the mass, covered with a coating of buff and often turned up at the edge in the manner of a cup.—The form of the febrile action is often highly excited, and the effect of the action, as judged by dissection of the dead body, is partly adhesive, and partly suppurative.

Serous.

Besides the sanguine and phlegmatic temperaments which obtain to greater or lesser extent in the ordinary states of health, and which appear to influence the character of the action which ensues from the impression of a febrile cause, there seem also to be predispositions in the serous part of the blood of such prominence and remark as to constitute a temperament which may without impropriety be called serous. The serous portion of the blood is the vehicle of all the heterogeneous matters which solicit expulsion from the circulating mass: all con-

tagions or acrimonies adhere to it, and they are all expelled from it through excretion. Of excretions, some are gross and visible, some subtle—not visible to the human eye, and only known to exist from the effects produced by their impressions. We cannot define what is not visible, and there is no use in forming conjecture: it is however safe to say that, in certain forms of temperament which obtain without cognizable signs of actual fever, the marks of an existing acrimony in the serous portion of the blood is more than conjecturable. The aspect is dry and withered, the habit irritable, the feelings irksome, itchings, eruptions and acrid excretions of different kinds are visible, sometimes annoying and distressing. The blood, as drawn from a vein and permitted to cool, separates into different parts, the serum abundant or deficient in quantity as may be, the taste and colour peculiar, but undefinable in words. Where the efficient cause of fever is applied to a subject in this condition of temperament, the morbid action which ensues has a particular character, modified by the nature of the acrimony which prevails, the form of the disease eruptive, bilious catarrhal, or contagious. Contagion is enveloped in exhalation so subtle as to be invisible, but it is susceptible of condensation and adhesion to inanimate matters, and, as it adheres, it may be and actually is conveyed by such means to distant places, where diffused, it propagates or multiplies itself to great extent.



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Nervous.

The nervous is numbered among temperaments by many writers; but it does not appear to me to have a general base, such as constitutes what with propriety can be called temperament. The signs which are thought to characterize it depend on the contingent condition of a particular organ, the influence of which modifies, but does not constitute the basis of the febrile process. The febrile process strictly and properly belongs to the circulating system; and, as connected with particular conditions of the sentient system, excess or defect of irritability in various degrees and variously modified, constitutes the sign by which that condition is expressed, viz. exquisite sensibility that does not bear ordinary stimulation without extraordinary reaction—spasm or convulsion; or deep torpor that refuses to react under strong impression.

Gangrenous.

The forms of temperament which are noticed above are to be considered as forms characterized by a mode of progressive action which produces something new or foreign to the habit; or, as constrictive through irritation, in consequence of which the customary functions of secretion are changed, impaired or suspended. They have each their counter parts—or retrograde. The gangrenous—stagnant or retrograde may be regarded as the counter part of the sanguine progressive. It is a form which occurs not unfrequently in tropical climates, frequently in temperate climates in infected and crowded hospitals. The existence of the temperament may be



ordinarily distinguished by a darkness of the countenance similar to what is seen in sea scurvy, by a dull, white or lurid inanimate state of the eye,—by a deep red, and generally by a moist tongue,—by a somewhat particular condition of the skin—thick and dry, or thick and clammy without active expression of circulating life, and by appearances in the blood which, as drawn from the veins, is considered to be characteristic, viz. crassamentum loose and easily broken,—sometimes without cohesion. This form of temperament arises on some occasions from general unappreciable epidemic influence; on others from artificial causes, viz. bad diet, particular kinds of grain, corrupted provisions, &c.; the effect augmented by excessively hot and dry weather, and rendered destructive by the accumulation of numbers of men into small space, whether in barracks, ships or hospitals. Where a cause of febrile irritation is applied to a habit in the state of preparation described, considerable tumult sometimes occurs previous to actual stagnation; sometimes stagnation takes place without much perceivable tumult. Stagnation is the effect of the morbid action; it is chiefly manifested in the organs of spongy texture, viz. liver, lungs and spleen, not even uncommon, as a gangrenous explosion externally on the extremities or other part, the structure of which has been previously weakened.

The phlegmatic, or lymphous temperament, has a retrograde as well as a forward movement,—the retrograde conspicuous in certain districts of country, particularly near the banks of fresh water rivers

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Phlegmatic---liquescent.

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and fresh water lakes in hot countries of a swampy or porous soil. The existence of this form of temperament is characterized by a pale and pasty countenance, more or less yellow,—by a dry, but ordinarily smooth and soft condition of the skin,—by paleness and bloodlessness of the gums and lips,—by smoothness, paleness and flaccidity of the tongue,—by blood, where blood is abstracted purposely, or where it escapes contingently, pale, watery and incohesive. Where a cause of febrile irritation is applied to a subject in the condition described, the progress to liquescence is rapid; and death is often sudden, unless counteracted by a concurrence of circumstances which totally change the condition, viz. supervention of winter or migration to another climate.—In the progressive form, the volume of the body increases, here it diminishes, the flesh becoming flaccid as wool.

Serous—  
liquescent.

The serous temperament, which indicates the existence of acrimonies, often of propagating quality, under progressive forms of action, assumes a course on some occasions that is retrograde or liquescent. The solid parts melt down under evacuation, viz. diarrhea, colliquative sweats, acrid and what may be termed liquescent forms of ulcer.

Remark.

The temperament of body which exists in the individual previously to the application, at least previously to the explosion of the action of the febrile cause, has always appeared to me to have influence in modifying the form of the subsequent act; and, on that account, I have in this place ventured to

state my opinion on the subject. It is a subject of some importance to be rightly understood by the practical physician, but it is not perhaps easily comprehended. I have cursorily touched upon it; but I cannot pretend to say that I have exhibited it in a clear point of view. The view which I give is that which presents to myself. I give it, not solicitous to do so through the affectation of presenting what may be considered as novel, or withheld from doing it because what I say may not altogether accord with popular opinion. From attending minutely to the base of temperaments, instead of confounding, I think I have been enabled to give a better discriminated and a more consistent history of the various modes of action which febrile diseases ordinarily assume than I should have been able to do without such attention; at least I have more satisfactorily accounted to myself for the changes that are so frequently observed to occur during the course of a disease's total duration. Where temperament is equal, or the constituent parts of the circulating mass are equally balanced with one another, the application of the cause of a febrile disease, though it subvert the action of health, subverts it, if one may so express it, on a general base: the action is morbid, but it is comparatively regular, the process regularly progressive to a termination, which leaves the channels of health open to the ordinary stimulants which move and maintain those forms of action which are essential to health. Where deviation in temperament proceeds so far

CHAP. I. from the constituted rule as to obtain an adjective term, viz. sanguine, phlegmatic, or serous; excess or unequal balance is inferred in the adjunct, and grounds given to believe that a basis is laid for the reception of morbid action—the tendency of which is dangerous in its own course and the termination of which is little perfect in the issue. Besides the forms of febrile action which move through the whole diseased course on the base of the original temperament, there occur numerous instances, particularly in the tendencies to temperament, rather than confirmed temperament, of change from one form to another; the cause which produces is not always clear; the effect is always explicable by admitting and calculating on the change which has occurred in the base of the original temperament.

## CHAPTER II.

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*Description of general Fever, more particularly as it appears in the Islands of the West-Indies and on the Coast of Dutch Guyana.*

**T**HE following descriptions of general fever apply to the disease as it appears in extremes, viz. mild and little dangerous, aggravated and pregnant with danger. By the term mild, as here applied, I mean a disease, the movements in which have a general tendency towards a favourable crisis, and in which death, when it does occur, is regarded as a contingency; by aggravated, I mean disease in which the general tendency is towards destruction, and in which recovery is effected by an act of force, viz. medical art or mere accident. The shades and degrees between the extremes are numerous,—the issue subject to many chances that act favourably or otherwise. A certain distinctive temperament of habit often exists, as already observed, in a person who becomes the subject of fever, previously to the actual explosion of the disease; it is little conspicuous in the milder forms; it is well marked in the

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more aggravated. The temperament which existed in the individual at the time of the application of the febrile cause, where such temperament was perceptible, is kept in view in the histories which are given in this sketch; but the history, I must observe at the same time, is not formed on a supposed base of temperament; it is drawn from what was most common in a multitude of cases which have fallen under my observation, such particularly as proceeded to their issue unopposed, or but feebly opposed by art.

### SECTION I.

*Description of general Fever, as acting on the base of the Sanguine Temperament.*

The blood, as drawn from the veins of febrile subjects who manifest different degrees of the sanguine temperament, is generally florid, of a bright red, and of a high temperature comparatively. It often flows freely from the vein and with great force, indicating strong arterial action. The crassamentum is firm and dense and somewhat dark coloured in one; in another, loose, soft and florid,—sometimes firm and turned up at the edges with more or less of buff coloured crust on the surface.

Invasion.

1. The *milder form* of continued fever, in temperaments which have a tendency to sanguine, some-

times comes on suddenly, sometimes gradually; the formal attack being preceded for hours, or even days, on some occasions, by unpleasant sensations at stomach, listlessness, head-ache, drowsiness, or watchfulness. The actual invasion is usually indicated by a sense of cold at the extremities and in the back; a creeping in the flesh, termed horror, sometimes by shivering and even by shaking. The sensations of cold are usually stronger in the periodic than in the continued forms, but they are rarely intense or of long duration in either. The sensation of cold is not constant and uniform. It alternates with flushings of heat at longer or shorter intervals—the heat for the most part soon prevailing throughout. The heat of the surface, as measured by the thermometer or judged by the touch of a healthy person during the tumultuary period of invasion, is rarely below the standard of health,—it is sometimes above it. The mouth is clammy, sometimes dry; thirst is considerable, sometimes intense; nausea is common, actual vomiting not rare; head-ache is generally considerable, sometimes sharp; pains in the back, in the joints, and in all the limbs are more or less distressing; respiration is more or less disturbed, sometimes hurried; the pulses of the heart and arteries are frequent as to measure in time, quick and excited in mode, sometimes irregular, generally small or contracted; the skin is hot and usually dry.

As the sensations of cold diminish, the sensations of heat increase: the actual degree of heat, as mea- Evolution.

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measured by the thermometer, sometimes rising to what may be deemed a high standard. Head-ache is often severe; respiration is regular, high—more or less hurried; the pulses of the heart and arteries are frequent, energetic and comparatively expanded; the skin is dry, warm, glowing and animated; the countenance is clear and florid, sometimes preternaturally flushed; the appearance of the eye is more or less changed—sometimes muddy as in slight ophthalmia—sometimes clear, lively and brilliant. The evolution is completed in twelve or fourteen hours. The commotion subsides in the continued form by partial moisture, by moderate perspiration in the remittent, by copious sweat in the intermittent.

Progress.

The milder form of continued fever acting on the base of the sanguine temperament has diurnal risings and fallings during the continuance of its course, the symptoms generally advancing progressively to a higher degree of intensity in proportion as the disease approaches to a critical period. The head-ache is sometimes very distressing during the period of excitement, the intellect disordered not unfrequently previously to the occurrence of the crisis. The pulse, which is usually small, frequent, and irregular, during the tumults of invasion, becomes energetic and expanded as the disease proceeds in its course; the skin is warm, even hot and animated throughout—soft, but without perspiration; the tongue is often foul—covered with a whitish or cream-coloured mucous coat; the thirst is considerable, but not excessive; the bowels are



torpid, sometimes difficultly moved by purgatives; the urine, diminished in quantity, is high coloured at all times—thick and turbid near the critical period; sleep is seldom refreshing or tranquil.

The symptoms now enumerated, subject, as already said, to risings and fallings at stated times, increase gradually in degree of intensity until the fifth, or oftener until the seventh day, when perspiration, frequently after excitement higher than usual, appears on the head and breast, descends progressively to the extremities, so as to become general, copious and lasting, often accompanied with calm and easy sleep, decrease of thirst, appearances of pustular eruption about the mouth, separation of the mucous crust which covered the tongue, craving of food, subsiding of the pulse to its natural or nearly to its natural standard, with other signs that indicate returning health.—The remittent follows a similar course and usually terminates by crisis about the seventh; the intermittent has no period of natural crisis.—The above history is given as an outline history of the milder form of continued fever. It applies equally to the remittent—with the difference between subsiding and distinct remission, and to the intermittent—with the difference between remission and intermission.

The action assumed by this form of febrile disease is what may be termed suppurative, viz. a process preparatory of regular crisis; the mode of termination—perspiration and hypostatic urine. The crisis is usually distinct at the time, but it is

Crisis.

Mode of  
Crisis or  
Change.

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not always final. Relapse occurs in many cases; and, where that happens, the character of the symptoms often differs in the relapsed disease from that of the original. But further, instead of regular crisis on a critical day, and relapse at an after period, the character of the symptoms sometimes changes on the fifth or seventh without signs of crisis, the disease assuming from that period a mode of action which may be termed retrograde, viz. the pulse becomes soft and weak, but still continues regular, even appears distinct and full as lightly touched—it sinks under the smallest pressure. The heat of the surface, under the change alluded to, is rarely above the natural standard, oftener below it; the skin is soft and flaccid, open and perspirable, in contradistinction to thick, constricted and dry; it is sometimes bedewed with sweat—not copious, fluid or warm; if copious, an unpleasant odour is diffused from it not unlike that of a fish-market. The lips are generally of a beautiful cherry red; the cheeks of a fine bloom like carnation; the bowels open, even loose,—the evacuations fetid, the odour peculiarly nauseous; the smell of the urine is offensive;—marks of colliquescence are general.—This form of disease did not often occur at Barbados between the years 1812 and 1815; it was common at Savanna-la-mar in Jamaica between the years 1774 and 1778; and it was seen occasionally in St. Domingo in the years 1796 and 1797.

Subject of  
the Disease.

2. The milder form of endemic, acting on the base of the sanguine temperament, is common

among natives, and those assimilated to climate by long residence. It tends to a favourable termination by a form of suppurative process which the ancient physicians termed coction. The *aggravated* is also frequent. It occurs among Europeans soon after they arrive in tropical latitudes; more particularly among soldiers who are crowded in their quarters, who are exposed to vicissitudes of weather, who encounter the fatigues of the field without precaution on the score of health, and who give themselves up, as they ordinarily do, to ease and enjoyment without discretion, after the fatigue of the service is past.

The attack of this form of disease is generally, but not always sudden; head-ache, weariness, irksomeness and other uneasinesses sometimes precede by twelve hours—sometimes by fourteen or more. The commencement, whether the type be continued or remittent, is marked by more or less of horror and shivering. The sensation of cold recurs at intervals; it sometimes continues long, but it is rarely high in degree. The head-ache, common to almost all fevers, is here severe—sometimes excruciating. It darts through the whole of the head, but strikes particularly at the fore-head and temples, accompanied by a sense of tightness over the eyes as from the binding of a cord. The eye is inflamed, muddy and confused; it often exhibits an appearance as if it had been exposed to the smoke of green wood, hot and painful,—protruded, occasionally agitated

Invasion---  
tumultuous.

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and wild. The countenance is flushed—even to a deep crimson; it is sometimes agitated and indicative of pain and anguish: sometimes torpid and bloated, as if rendered inanimate by plethoric oppression. The tongue is often white, clammy and moist,—sometimes brown, rough and dry,—sometimes little changed in appearance from the tongue of a person in health. Thirst is irregular.—Where nausea prevails, thirst is seldom great; nausea and a desire to drink, notwithstanding, sometimes meet together. Pains of the joints, of the back and of the calves of the legs are often severe—similar to the racking pains which accompany the cold stage of the malignant intermittent.—Spasms or cramps are not uncommon,—they are of the same kind with those which occur in cholera. Nausea, or sickness at stomach, is an early symptom in most cases of this form of disease; it is in fact often synchronous with the first feelings of indisposition. Where actual vomiting takes place, the matter ejected, (after the simple contents of the stomach are discharged,) consists, for the most part, of a watery viscid fluid,—rarely bilious, unless where the disease moves by paroxysm and remission. Delirium occurs sometimes, but not often: where it does occur, it is ordinarily violent—an outrage of short duration. The pulses of the arteries are frequent in number in a given time, usually small and contracted, concentrated, or deep seated; sometimes they are irregular, hurried and tumultuous, struggling, if one may so speak, for

expansion, or liberty from the hand of oppression. The heat of the extreme surface is seldom great as judged by the light touch. A limb, or any part of the body grasped strongly by the hand, often scorches, the ardency intolerable on some occasions. The skin is usually dry—thick as if preternaturally compacted, torpid and little sensible of stimulation; if moist, the moisture is clammy and greasy, not warm and fluid—such in fact as characterizes agonies of suffering rather than energies of circulation. The alvine evacuation is irregular: the bowels are most commonly costive, or more correctly speaking, torpid, obstinately resisting the action of the strongest purgatives; if loose, the evacuations are watery and ineffective. The urinary discharge is diminished in most cases; in some, it is, in a manner, suspended.

The tumult of the forming fever ordinarily subsides after a duration of ten or twelve hours. The intensity of the head-ache abates; the eye becomes comparatively serene; relief is upon the whole considerable, sometimes so considerable as to be taken for a remission,—but the remission, even in its most perfect form, is of short duration. In less than six hours in some and in twelve or fourteen in others, the symptoms recur with aggravation. They recur without sensations of previous cold in the continued form, with sensations of cold scarcely perceptible even in those which may be ranked with remittent. The pulse, which during the first twelve hours, was small, frequent, hurried, and irregular, is now hard

Progress---  
tumultuous  
---impeded.

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and quick, the stroke at equal intervals of time, but without that freedom of dilatation and energy of contraction that indicates a tendency to favourable crisis. The impression made by the condition of animal heat is strong, particularly on the head and trunk—deep and concentrated; the measure of heat on the surface and extremities, especially if the surface be lightly touched, appears to be moderate, if the part be closely embraced by the hand, the pungency is unpleasant to sensation. Thirst is irregular—intense, or little observable. If nausea prevail, and, with nausea, the tongue be foul and moist, thirst is seldom great; if urgent, there is at the same time a loathing and aversion from the act of swallowing. If the mouth and tongue be dry, thirst is intense. Vomiting and intense thirst, as already mentioned, sometimes meet together, but not commonly. A sense of burning pain and anguish is often felt at the pit of the stomach; the pain is not acute, but it is impatient of the lightest touch. The head-ache, which had somewhat abated at the close of the first twelve hours, usually recurs with the recurrence of other symptoms; it sometimes recurs with intolerable severity, the temporal arteries beating strongly, the carotids violently. In other cases, the pain is less acute, the vibrations of the carotids less sensible; but a sense of heaviness and fulness pervades the whole head, sometimes accompanied by drowsiness—without sleep. The ideas confused, the mind is not under command, but delirium, properly so called, is not common. The countenance

continues to be highly flushed—sometimes flushed even to crimson; the features are turgid and stiff—without expression; they communicate an idea of suffering from a load of oppression. The skin is compacted, thick, dry—in a manner impervious, and of so little sensibility that the strongest blisters sear but do not vesicate. The muddiness, apparent inflammation, and unpleasant aspect of the eye, increase; the urine is high coloured, the discharge scanty, the secretion nearly suspended: the bowels are still torpid, insensible to the action of the strongest purgatives; or if irritated into action by repeated applications, the effect is irregular and by starts, the evacuation so extorted, watery and ineffective. Respiration is often hurried and irregular, occasionally deep and laborious. The sense of anguish and feeling of anxiety referred to the stomach is inconceivably distressing. Fidgetting, or the incessant desire to change place and posture, without object or apparent cause, is singularly conspicuous, and in a manner characteristic of this form of disease. The muscular strength does not often appear to be materially impaired by the tumults and sufferings that have been described; at least there is no indication of weakness or disposition to faint when the patient rises up, walks about in his apartment, or even when he walks to some distance.

The above is the description of the concentrated form of tropical fever in the sanguine temperament, where no accident has occurred, or where no artificial treatment has been employed to modify its ac-

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tion. Where effective remedies have been employed, or where accidents have occurred, which produce a change in the circumstances of the case, the powers of circulation expand, the pulse opens, the skin recovers animation, the head-ache continues severe, but the pain assumes a new character. Delirium of different kinds, tremors, agitations, and other modes of action which denote increased animal irritability, often now manifest themselves; and even the distinction of paroxysm and remission, though obscure, now often becomes observable.

Acme--  
Decline or  
Retrograde.

The duration of the febrile irritation varies in different subjects and under different circumstances of treatment. In the most concentrated, as left to its own course, it does not extend beyond twelve or twenty-four hours on some occasions; it more commonly continues thirty-six, forty-eight, or even sixty—with occasional risings and fallings in the interval, but not with such abatements as can with propriety be called remission. From this acme or point of highest progress, it declines, sometimes gradually, sometimes rapidly. The increased heat forsakes the surface, even falls low on the extremities; it still continues high and pungent on the trunk of the body, particularly at the pit of the stomach. With this change in the state of animal heat, the pulse also changes. It frequently becomes regular, full, and slow, so as to be scarcely distinguishable from the pulse of a person in health; sometimes it becomes full, expanded, and apparently energetic, so as to give deceptive expectations of crisis by sweat.



The tongue is now moist, red, and clean, at the edges, such as resembles the tongue of a person in whom the febrile process has ceased. The appearances of tumult, and even the turgidness of the countenance, subside, but the countenance does not resume its natural animation; on the contrary, it becomes inanimate, dull, and inexpressive. The eye, muddy and confused in the first days of the disease, becomes comparatively calm at this point of the course; but, while the appearance is thus calm, the veins generally become turgid, even distended as if they had been filled by injection. The skin, which was always thick, and in some degree torpid, is now in a manner impervious, as if it had lost connection with the living system.—About this time also, viz. the acme of the progressive course, a tinge of yellow is observed in the tunica albuginea of the eye, at the angles of the mouth, at other less coloured parts of the skin.

Fever, considered as a progressive process, terminates at the point described. From that point, a series of organic derangements commence, which proceeding with more or less rapidity to partial destructions, implicate in their consequences the general destruction of life. The stomach suffers primarily and principally in the concentrated continued fever of the West-Indies. The character of the suffering is various and not easily defined. It does not consist in pains and spasms, retchings and vomitings of bile and other matters, as in the paroxysms of the ordinary remittent. It consists more commonly in

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a peculiar sensation of nausea, burning and anguish, accompanied with the ejection of such liquors as have been taken down in drink, rendered ropy and viscid by foreign admixture: this applies only to the early stage. From the point of subsidence, the local distresses in the region of the stomach increase. Of these sensations of burning heat, a sense of weight and heaviness, anguish, impatience of pressure, obscure and interrupted hickuping, nausea and actual vomiting, are the most conspicuous. The matter ejected by vomiting, at first ordinarily clear and ropy in itself, soon becomes intermixed with shaggy flakes of a somewhat dark colour, the quantity ejected frequently much exceeding the amount of all that has been drank. But, though the quantity of the matters ejected by vomiting be often great, the ejection is not made by straining or severe effort;—unavailing retchings do not in fact belong to the history of the disease. It was stated above that what is thrown up is at first ropy and clear, intermixed with shaggy dark coloured flakes. It becomes black and dirty like the grounds of coffee, sometimes black as soot mixed with water for some hours before death, that is, generally about the middle of the fourth day.—The bowels, as already observed, are little sensible to the stimulation of purgatives in the first days of the disease. They are now often loose, the evacuations small and ineffectual—rarely feculent—often dark coloured like tar or molasses—sometimes viscous as bird-lime. The unconquerable desire of changing place and posture,

so common in the early stage and so characteristic of the disease, abates or disappears as the febrile state subsides; and, with the exception of distresses from local disorganizations—and even with these there is rarely any indication of personal suffering;—a veil of torpor covers the whole expression—intellectual as well as corporeal. The countenance is calm, but inanimate; the eye heavy; the veins of the tunica albuginea distended with blood as if they had been artificially injected; the aspect hideous—not wild, but such as melts the heart to pity. The mind is composed,—preternaturally firm amidst all the horrors of approaching death—even preternaturally firm under the conviction that death is certain—and not far distant. Delirium is by no means common in this form of disease. Where it does occur, it is, for the most part, only a temporary outrage which, passing into convulsion, precipitates into death. The skin which was thick, compacted, and little sensible to stimulation from the commencement, loses its animation rapidly from the time the febrile state begins to subside. Sensibility and the ordinary evolution of animal heat forsake the surface, particularly at the joints and extremities of the body; the hands and knees become marbled, tawny, and brown, like mahogany; livid patches on the softer parts, viz. abdomen, scrotum, and inside of the thighs, indicate the loss of life and circulation in the part; hæmorrhages, viz. oozings of blood from different parts of the body are common,—they indicate a loss of its cohesion or vitality. The tinge of yellow, which is

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observed in the white of the eye and some other parts of the body at the time the febrile state begins to subside, increases rapidly for the most part, sometimes with such rapidity as to attain the deepest shade—viz. the colour of an American savage, in the course of a few hours.—If the disease terminate fatally before the third day, or if it do not go through the processes here described, yellowness is a rare occurrence, and black vomiting is scarcely ever seen.

Evolution  
artificially  
produced.

The fever which I have now described is the extreme of the forms which act on the base of the sanguine temperament; the outline of the history drawn from materials that were collected during service with the British army. The disease is concentrated, but it has nothing peculiar in its nature beyond concentration. It is within the power of the medical art either to arrest its course at the commencement, or so to diminish its violence as to produce a moderate disease analogous to common continued fever in temperate climates. In this manner where the condition is changed, the course not decisively arrested by medical treatment, the pulse becomes frequent, vibrating, strong and expanded, the vascular action uniformly diffused, the heat equalized, the skin warm, soft and animated throughout, the pains of the head less oppressive but more acute. The eye still continues inflamed, but it is less surcharged; the countenance is flushed, the complexion comparatively clear, the features expressive, the tongue dry, the thirst great—corresponding with the appearance of the tongue. The function of the bowels is often ir-

regular, but the bowels are no longer insensible to the stimulation of purgatives. Where vomiting takes place, the matters ejected are often bilious, the appearances such as indicate freedom of action in the organs of the gastric system. Delirium is not uncommon—it in fact often runs high; in short, the whole train of action, though often excited in a high degree, indicates comparative relief from oppression, accompanied with signs of tendency to a favourable termination by the regular process which produces crisis.—In some instances the type of the disease is changed to periodic by the force of the means employed on this occasion.

The duration of the more concentrated form of fever allowed to pursue its own course, seldom, when fatal, extends beyond the morning of the fifth day. The duration of the mitigated form, whether mitigated by treatment or accident, often extends to the seventh, the ninth, and even sometimes to the fourteenth. The favourable termination is effected through the suppurative process, exhibiting signs of regular crisis, the fatal termination through excessive excitement implying organic injuries, vital exhaustions and gangrene, or by unusual irritation exciting convulsion and producing local oppression or effusion in the brain, the common consequence of unrestrained violence. It sometimes happens, where the febrile excitement is equally conspicuous in every part of the system, that the pulse continues high, full, free and expansile for one or two days, or even more, so as to give expectation of approach-

Duration  
and Termination.

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II.

ing perspiration and critical change; but, instead of perspiration, the skin continues closed and dry, the energy of the pulse diminishes, its power of expansion decreases, and all signs of febrile action at last subside in venous paralysis, characterized by oozings of blood from different parts of the body, particularly from the interior of the alimentary canal—from the mouth downwards. In this protracted form of the disease, there is rarely any appearances of jaundiced yellowness, or of black vomiting; but an olive dingy yellowness, often perceivable about the sixth or seventh day, increases gradually until the final termination. Blood in such case frequently oozes from the whole surface of the alimentary canal for a day, or two, or more, before death; and, as appears on dissection, the cavity of that canal is sometimes partially filled with it.

Remittent.

I have endeavoured to give an outline history of the different forms of fever as it appears to act on the base of the sanguine temperament, viz. mild and regular, concentrated and anomalous, especially as left to itself, or as imperfectly moderated by treatment; and to this I shall only add that fevers of the remittent type, which occur under the habit alluded to, are sometimes violent, the paroxysms severe, the remissions imperfect. The favourable termination is generally about the seventh day, effected through the suppurative process, which tends to regular crisis by free and copious perspiration, pustular eruption about the mouth; effective, feculent, alvine evacuation, &c. The period of the fatal termination is

less calculable; death is often precipitate—effected through convulsion, sometimes gradual, effected by congestion—cerebral or abdominal.

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*Dissection.*

Dissection of the dead body is important in the view of obtaining correct knowledge of the history and nature of any given case. It does not show the disease in action; but it shows the ravages which are committed by its action on organic structure,—and it thus points to remedies of prevention in future similar cases. The following history of morbid ravages in the form of disease now described is drawn from a large field, and comprehends the sum of what is seen where the course of the disease has not been opposed, or but feebly opposed by art.

The blood vessels which are spread over the membranes of the brain were generally numerous and turgid, often distended as if they had been artificially injected. The dura mater was, for the most part, preternaturally red throughout its whole extent, more particularly at the falx and parts adjoining to it; in addition to which, circular spots of the size of a dollar, more or less, were often observed near the joining of the coronal with the sagittal suture of a still deeper red, sometimes of a dark red like that of actual gangrene. Extensive adhesions were not uncommon; and substances resembling curd or new cheese were observed on some occasions near the falx. The substance of the brain

Brain.

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was ordinarily firm—often turgid with blood—poured out, at numerous points, after the dissecting knife; the choroid plexus frequently resembled an unorganized clotted mass; the ventricles were filled with water in some cases—not in all, not perhaps generally.—In milder cases, at least where paroxysms and remissions were discernible in the course of the disease, effusion of water into the ventricles and interstices of the brain was not an uncommon appearance.

Thorax.

The lungs rarely showed any marks of ravages from this form of disease, whether continued or remittent; at least, where any thing uncommon was observed, the appearance was such as might be imputed to accident.

Abdominal  
Cavity.

The parts contained in the abdominal cavity were always altered, sometimes much changed in their structure. The omentum and all the omental appendages were ordinarily of a grey, dirty, olive colour—dry, without moisture or unctuousity. The blood vessels, viz. veins were distended as if they had been injected; but marks of what is termed inflammation, or tendency to suppuration were rarely observed. The exterior of the stomach and intestinal canal corresponded in colour with the omentum and its appendages; viz. grey, dry—and marcid as if all exhalation had been suspended—the blood vessels distended. The appearance of the interior of the stomach and intestines was different in different subjects, and at different places in the same subject. The veins were generally turgid; the villous coat



was abraded at some places, loose, and in the act of separating at most; the surface underneath the separated villi was streaked with bright or dark red, even studded with clusters of points not unlike measles—most numerous at the upper orifice but not confined to it. In some instances, the mouths of canals were visible at different points in the interior surface, yielding a dark coloured fluid by pressure. The stomach itself was often of large capacity—sometimes smooth—sometimes corrugated interiorly. It generally contained a large quantity of liquid, sometimes of the colour of muddy coffee, sometimes of a deeper shade, sometimes pale and dirty, ropy and viscid with numerous shaggy flakes swimming in it. These flakes appeared, on examination, to be abraded portions of the villous coat.\* The interior of the intestinal canal resem-

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\* The source, from which the matter ejected by vomiting in the latter stages of the fever of the West-Indies, receives its black colour, is a point upon which medical writers are not yet agreed. The greater number of them seem to consider the matter in question as consisting of blood mixed with the juices of the stomach. The opinion is mere supposition of probability founded on no direct evidence; on the contrary, contradicted by accurate examination of the fact. Blood exudes from the whole tract of the alimentary canal—from the mouth downwards, and is mixed with the fluid in the stomach and intestines in various proportions in certain forms of the yellow fever, without producing a compound that in any degree resembles the matter of black vomit. This, I think I have ascertained by examination. The contents of the gall-bladder are changed, in almost every case of the concentrated yellow fever which runs

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bled the interior of the stomach, more particularly the portion of it which bears the name of duodenum.

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the course described above, into a thick black fluid resembling tar or molasses. The fluid may be traced by means of its colour from the gall-bladder into the duodenum, and from thence into the stomach; and, as the colour is diffusible, some part of it is, as may be reasonably supposed, imparted to the fluids contained in that cavity, whatever these may be. This admixture of the contents of the gall-bladder, or secretion of the liver, with the fluids contained in the stomach, I considered at one time as the principal or sole cause of the colour of the matters ejected from the stomach during life, or found in its cavity after death; but, having observed that matter resembling tar or molasses was sometimes voided by stool under circumstances which showed that the source was not remote—and where there was no ejection of black matter by vomit, I thought it of some importance to endeavour to ascertain from whence it came. In this view, the dead body was examined, and after diligent search the mouths of ducts—not blood vessels, were discovered in the interior of the colon containing a dark-coloured fluid similar to that which, during life, had been discharged by the anus. This seemed to explain the cause of the appearance in so far as relates to the tar-coloured stools; but, proceeding farther with the investigation, similar canals discharging a tar-like fluid into the interior of the stomach, more especially near the upper orifice, were in like manner discovered in almost all cases where black vomiting had been a conspicuous symptom of the disease.—The appearances were noted, and they were often verified by inspection, and, from the evidence of what then appeared, I do not conceive myself to be under delusion in advancing the opinion that the black colour of the matters ejected from the stomach, or discharged by the anus in the latter stages of certain of the forms of the fevers of the West-Indies, arises from admixture with diseased secretions from the mucous membranes of the whole gastric system, more especially of the liver. It may be

Portions of the interior coat were actually abraded; considerable portions of it were loose and in the act of separating, particularly in the colon. A series of vessels sometimes appeared underneath the separated villous coat, containing a dark fluid like molasses, sometimes thick and viscous; in others, where the continuity of the coat was not broken, an appearance of a velvet or downy substance of a sky-blue or dark purple colour was occasionally observed.

The liver was distended, heavy, and generally of an increased size, its colour often variegated like marble—red and yellow, the blood vessels filled with dark fluid blood, the biliary pores often overflowing with dark coloured fluid. The gall bladder was sometimes full, even distended, sometimes nearly empty; the fluid therein contained almost always of a dark colour, often thick like tar or molasses; its course was, for the most part, easily to be traced through the duct into the duodenum, and from thence into the stomach, where it appeared to tinge, at least to contribute largely to tinge with black the fluids therein contained.

The spleen was generally distended, sometimes distended even to rupture.

Spleen.

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added in illustration of the opinion, that the secretion is ropy and clear during the early periods of the disease, that it becomes brown or black in the latter—sometimes black as soot.—The sooty or ink-like colour is chiefly observed where the head and stomach are simultaneously attacked, and where no strong vascular action takes place during the subsequent course.

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II.  
Bladder of  
Urine.

The bladder of urine was often contracted to a small size, its coat dense and firm as if it had been long in a state of constriction;—it rarely contained any quantity of urine.

The appearances noticed above belong properly to the more concentrated of the continued fevers of the shortest duration. Where the course is protracted, whether by contingency or formal medical treatment, the violence of distention in the organic structure is comparatively less, and opportunity is thereby often given to the disease to develop its regular febrile action. The excitement is then principally manifested in the general action of the vascular system, and venous paralysis, apparently an effect of over excitement, is then often the ostensible cause of death. The intestinal canal was, in such case, frequently filled with a quantity of effused blood, which, when the intestine was viewed exteriorly gave an appearance of gangrene, but which in reality belonged only to the contents; the coats of the intestine were sound. The spleen and liver were often gorged with blood,—the blood grumous without cohesion.

To the general description given above, which, in order to be scientific, must be supposed to exhibit all the circumstances which do occur, or which may occur in fever, moving under the influence of general temperament and acting on a general system or series of parts, I shall add a few cases of individual history in illustration of the fact. The cases are taken from case books written in hospitals in the presence of the sick, not scientifically arranged and minutely detailed, but useful as illustrative.—I have selected such as were fatal, that I might have

the opportunity of adding to them the appearances that present on dissection of the dead body. The general base of the temperament was sanguine, but so far mixed on many occasions as to present appearances of the adhesive as well as of the suppurative inflammation or of its excess, viz. gangrene.

## CASE I.

*April 9th, 1812.* Braithwaite, aged 28, newly arrived in the West-Indies, of a gross habit and heavy countenance, was attacked about six o'clock in the morning, and brought to the hospital about six in the evening. He complained of severe head-ache and giddiness; the face was flushed,—the eyes muddy; he was anxious and restless;—laboured in breathing, apparently from oppression at the præcordia, rather than from impediment in the lungs themselves. The pulse was small, frequent, sharp and contracted; the tongue was foul; the heat great; the skin dry; thirst vehement; pain of the back distressing. He was bled to the extent of thirty-two ounces; a purging bolus was given immediately,—repeated in four hours and accelerated in its operations by a common clyster. He seemed a little faint after bleeding and expressed ease but no decided relief. *10th*,—passed the night in trouble and distress, and is now anxious and uneasy about the præcordia; sighs frequently and breathes with catching and difficulty at times; pulse quick and hard, frequent and strong; the skin dry and hot: bled to the extent of fourteen ounces; the skin became moist; the pains remitted, but did not cease. Blisters were applied to the head and stomach;—bowels not freely opened by the purgatives:—calomel and James' powder every third hour; inunction with mercurial ointment; fever mixture; fomentations to the extremities. He sweated copiously in the afternoon, had some evacuations by stool and seemed to be considerably relieved. *11th*,—skin dry; pulse strong, not frequent; thirst urgent; anxiety and sense of burning at the præcordia; nausea and vomiting; ineffective motions downwards; eye and countenance not clear; temper irritable—im-

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patient—alarmed at his situation. He does not complain much of the pain of his head, except of the blisters which give him strong sensations of burning; the heat of the surface is rather above natural; there is no moisture on the skin; the tongue is rough and foul, but not remarkably so. 12th,—no progress towards recovery; expectations less flattering than yesterday in time of the perspiration; he vomits occasionally; his nose bled in the act of vomiting; anxious, restless, extremely uneasy; pulse regular, full and strong; ideas confused; countenance assumes a yellow tinge. 13th,—somewhat delirious; restless and anxious beyond measure; eyes red; gums red and hot; no salivation; pulse regular, full—not weak; skin obstinately dry; the yellow of a deep shade; eye muddy and surcharged with turgid veins; the blistered surfaces dry and of a dark red colour. He was washed with salt and water: frequent small viscous evacuations downwards. 14th,—delirious with extreme restlessness; pulse soft, full, and slow; skin damp; heat moderate; vomits glutinous matter of a dark colour. Died about seven o'clock in the evening.

*Dissection of the body.*—The vessels on the surface of the brain remarkably turgid, giving an appearance of lividness or gangrene in several places: effusions of lymph in quantity, and adhesions between the membranes, particularly near the falx. The mass of inflammation, effusion, adhesion, and engorgement, such as is rarely seen. The stomach and intestines contained a great quantity of black matter; in the intestines it was thick as tar, and viscous as bird-lime; the gall bladder was half full of black bile.

## CASE II.

Andrew Fraser, aged 30 years and of a full habit, was seized at nine in the evening of the 26th of April and admitted into the hospital on the morning of the 27th. The most striking of the symptoms at that time were head-ache, giddiness and confusion, flushed face and red eyes; the pulse 98, full and strong; the heat 94; skin dry; tongue furred; thirst vehement; body open. Bled to the extent of thirty-four ounces; the pulse fell

from 98 to 74; the heat from 94 to 92; tepid bath; purgatives; blisters to the head and stomach. Evening,—pulse 88, full and soft; tongue less foul; head-ache relieved; skin dry; vomiting frequent—the matter ejected only what was drank—lightly tinged with bile. 28th,—vomiting incessant; head-ache much relieved; pulse 73; heat 91; skin soft, but dry; tongue moist; pulse soft, small,—not more than 86 at the most aggravated period; heat 94; body open; frictions with mercurial ointment and warm oils; frequent small doses of solution of zinc and alum; vomiting incessant. Died at 5 o'clock in the evening, (within the third day). *Opened*.—The dura mater inflamed along the course of the longitudinal sinus—even to gangrene; effusions of coagulable lymph and adhesions between the exterior and interior membranes; the veins turgid to excess; many inflamed spots on the internal surface of the stomach; much black matter in its cavity; black sooty matter in the gall bladder.

## CASE III.

Corporal Gentle, aged 22, of a spare habit, was attacked on the 11th of *May*, at 10 o'clock in the morning, with violent head-ache and other symptoms of fever; the countenance flushed; the eyes red; the pulse 140—full and strong; the heat 104 and pungent in kind; the skin dry; the tongue clean and moist. Bled to the extent of 40 ounces—not much relieved; head shaved and blistered: purgative. 12th,—head-ache continues; pulse 100—small and hard; heat 102; tongue furred and dry; eye inflamed; thirst great; body open; the violence of the symptoms subsides and returns irregularly; the pulse becomes more full and less frequent; the skin soft; heat diminishes. Bled in the course of the day, but with little effect; tepid bath; calomel and James' powder; Aq. Ammon. Acetat.; camphire. 13th,—delirious—with great anxiety; pulse 97, weak and feeble; tongue covered with a dark brown fur, skin with clammy sweat; bleeding at the nose. Died at 6 in the morning of the 14th, (within the third day). *Opened*.—The dura mater much inflamed and gangrened in the course

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of the coronal and sagittal sutures; considerable effusions of coagulated lymph forming adhesions on both sides of the falx; the sinuses very turgid with blood; the pia mater much inflamed; the ventricles distended with serum. The stomach and gall bladder contained black matter.

## SECTION II.

*Mode of Febrile Action in what may be termed  
Gangrenous Temperament.*

The form of febrile action, which obtains under the predominance of the gangrenous temperament, has a retrograde tendency of more or less rapidity from the commencement. In giving the history of the disease, I take the extremes only, viz. slight and slow, concentrated and comparatively rapid. It is to be observed in this place that the fever of the West-Indies is sometimes epidemic without malignity, sometimes epidemic and malignant in an extraordinary degree—more fatal than the plague itself.

*Invasion.*

The *milder* form of fever ranked in this place in the retrograde series, and considered as acting on a temperament of gangrenous tendency, may be regarded as the counter part of the first of the sanguine. It sometimes begins insidiously and proceeds slowly and secretly for a day or two; but in general the invasion is sudden and the character discernible from the moment of attack. The com-



mencement of this, like that of most other fevers, is marked by a sense of cold and chilliness, seldom strong, but often of long continuance. The heat which succeeds to the cold is rarely increased beyond the natural standard on the surface of the body as lightly touched, sometimes it does not attain the natural standard on the extremities; it is ordinarily high, pungent, and acrid, on the trunk and about the præcordia. The countenance is more or less dark and clouded—grim or livid as in sea scurvy—dull and without expression. The lips are dry and often bluish; the eye without animation—the white bright, glossy or pearly; the skin is usually thick and torpid—of a brown dingy colour, particularly on the extremities; sometimes it is greasy and damp; sometimes tender of the touch as if it had been bruised. The tongue is often smooth and moist—sometimes unusually red—the red tending to livid. Thirst is irregular; nausea and sickness not uncommon. The pulse is usually small and frequent—not energetic,—often sunk, or concentrated. Pains in the head and loins are sometimes severe—oftener irksome. The bowels are irregular, generally costive. Respiration is often oppressed—deep and heavy; a disposition to sigh, without local pain, is prominent among the symptoms:—the whole aspect is unpleasant.

The above symptoms often remit after a duration of about twelve hours; they do not entirely disappear. They recur at a short interval, and they advance to a final termination, sometimes by a regu-

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lar, sometimes by a less regular process—and with different degrees of velocity. If the course be rapid, the skin and countenance become dark as in deep sea scurvy, the joints marbled and often of the colour of mahogany, the lips dry and livid; the tongue is often clean, red, dry, glossy, or shining; the eye glossy, vacant, and inanimate. Nausea and even vomiting occur sometimes; but they are not urgent. The bowels are usually open—the evacuations small, watery and ineffective, or loose and colliquative: the secretion of urine is scanty—sometimes in a manner suspended. The skin is generally dark, sometimes blue as a violet—and withal torpid, little sensible to irritation from blisters or other external application.

Such is the disease; the general tendency is retrograde, the progress towards dissolution often rapid, sometimes completed within the fourth or fifth day. Where the course is more protracted, the pulse expands at one time, becomes frequent and feeble at another—even sinks so as to be scarcely if at all perceptible; it again emerges, and, in this manner, alternate risings and fallings of the febrile process are observed diurnally, sometimes for ten days or even a fortnight. The patient, in such case, emerges from danger by slow degrees, or sinks down gradually to death under appearances of stagnated circulation; the respiration, during this interval, being sometimes free, sometimes laborious so as to threaten suffocation,—the tongue often dry and covered with a black scurf.

*Dissection.*

The following appearances were more or less observable in all, or in almost all those who died of this form of disease. The veins and sinuses within the head were turgid—distended with black blood; the choroid plexus appeared sometimes as an unorganized clot of blood; the lungs were frequently black resembling a sponge filled with blood—sometimes throughout, sometimes partially,—the substance was sometimes firm and dense, not unlike the substance of spleen. The veins of the omentum and of the external coat of the intestinal canal were distended throughout—the blood of a dark colour. The small intestines, as viewed exteriorly, often appeared black as if gangrened; the interior was filled with grumous blood—the coat of the intestine itself not diseased. The liver was often enlarged in size, distended with black blood, its substance rotten, its exterior coat sometimes ruptured by distention; the contents of the gall bladder were often of a pale colour and of a thin consistence; the spleen was generally large—the coats frequently ruptured—the interior a grumous mass.

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2. The *concentrated* fever of the West-Indies, as manifesting action on a temperament of gangrenous tendency, or that rapidly assumes the gangrenous tendency through contingency, occurs under the operation of inexplicable epidemic causes, or

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under combinations of artificial local causes of unusual force. To the epidemic influence may perhaps be ascribed the fever which appeared in the island of Grenada in the year 1793, also that which appeared in the 25th regiment of foot, quartered on Brimstone-hill in the island of St. Christopher, in the year 1812. Examples of the artificial occur frequently in military service, and strong examples of it occurred in St. Domingo in the year 1796 in re-embarking troops, recently arrived in the country, in order to be conveyed to different stations in the island, especially where the transport ships were crowded, the weather dry and excessively hot; it was also strongly exemplified in crowded barracks, particularly at Port-au-Prince among the Rohan and Hompesch hussars.

Invasion.

Where the disease proceeds from epidemic influence, the course is only partially affected by the obvious conditions of the atmosphere; where it arises from local causes artificially engendered, as the source of the cause is within observation, so to modify or change the form of the subsequent action, is often within the compass of medical science, if medical officers were intrusted with command of means. The occurrence of this form of disease, as arising from artificial causes, is common in excessively hot and excessively dry weather; in the stagnated, heated, and impure air of crowded barracks, or crowded transport ships, more especially where the subjects of it have lived at freedom in open air, or occupied a cool and mountainous district in the country. But, from whatever cause the disease may

proceed, epidemic or artificial, the fatal course is rapid, the proportional mortality high beyond the mortality of other diseases.

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History.

In regard to history: the symptoms commence with more or less of cold, the heat which succeeds is seldom high as judged by the hand, or as measured by the thermometer applied to the surface; the sensations of internal heat and internal burning are often insufferable. The skin is thick and torpid; the countenance is dark and grim, sometimes agitated, sometimes torpid and inanimate—bloated without expression—livid and of a peculiar gloss. The eye is usually clear, white, vacant, with an idiotic drunken stare; sometimes it is confused, agitated, and protruded. A sense of anguish at stomach, scarcely to be expressed in words, sometimes accompanied with nausea—sometimes without nausea, often distresses the patient in an extreme degree. Delirium occurs sometimes, and, when it does occur, it is furious, but the occurrence is not common. The pulse is sometimes irregular and irritated, impressing the idea that it is restrained from expansion by some latent cause of resistance; sometimes it is slow, sluggish, overwhelmed as it were by a load of oppression. The respiration is more or less disturbed; deep sighing is usual; gasping for breath, or an unceasing attempt to fill the lungs without the power to do it, is common; when present, it characterizes an aggravated form of disease. The tongue is often swollen, and, as such, incapable of distinct utterance; sometimes it is smooth, red, or rather livid; some-

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irregular.

times white and foul, the surface strewed with mealy patches ; sometimes it is foul and leaden coloured.

The above appearances are conspicuous under the tumult of invasion ; and, under this tumult, convulsion sometimes supervenes, and the patient dies apoplectic before the close of the first day. But in general, the action assumes an ostensible febrile form ; and, under that form, advances, with more or less regularity, until the third, and sometimes until the fifth day, when it usually terminates fatally. Where the disease assumes the ostensible febrile form, the tumults and agitations so conspicuous during the period of invasion, somewhat subside at an interval of ten or twelve hours, the disease notwithstanding proceeds. The pulse is variable during the course of the fever, sometimes frequent, sometimes slow, sometimes irritated—never free and energetic ; it is ordinarily oppressed—rendered calm under oppression ; or it is tumultuous, struggling as if to free itself from oppression. The functions of secretion and excretion are disturbed ; the urinary discharge scanty, sometimes altogether suspended ; the bowels are usually bound—not sensible to the stimulation of purgatives, irritated, not excited to proper action by the strongest ; in some cases they are loose, the evacuations ineffectual of relief—watery, and without feculence. Restlessness and anguish of suffering, generally referable to the præcordia, are here singularly combined with general torpor and perverted sensibility. Nausea, even retching to vomit, is common ; actual vomiting occurs not unfrequently, but

the vomited matters have no peculiar character. Delirium, where it does occur, is generally furious, often connected with tremors and spasms which terminate in convulsion and death. Respiration is more or less oppressed—frequently oppressed without sensation of local pain. The skin is generally thick and torpid—not warm superficially, glowing, and animated; a sense of ardency or burning is notwithstanding felt at the præcordia—the sensation unpleasant; the countenance is peculiar—dull and heavy, characterized by something of livid glare not easily described in words.

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Retrograde.

In two days, sometimes in three, and, on some occasions not sooner than four or five, the febrile irritation now alluded to subsides in a torpor, which pervades every part of the system. The skin, which was thick and somewhat livid from the first, becomes livid and dark like the colour of old mahogany, sometimes uniformly dark, sometimes marbled, cold, and impervious, as if it were deprived of the circulation and life. The most acrid applications make no impression on its irritability, and the approach of death, in all its horrors, rarely makes any impression on the sensibility of the mind. The countenance, which was always grim and clouded, often of a peculiar livid glare, is now torpid and inanimate; and, where vascular action had manifested any considerable degree of excitement in the preceding course, it sometimes acquires a deep tinge of disagreeable dirty yellow. There also appear at this time numerous and extensive effusions, or ecchymosis, into

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the cellular membrane, particularly about the scrotum and abdomen; the hands, feet, and knees, are cold, marbled and tawny. Hæmorrhage, or rather oozings of blood are observed occasionally at almost every open cavity, but most frequently at the anus. Black vomiting and purging of black matter, easily distinguishable from oozings of blood with its contingent mixtures, occur on some occasions near the last hours of life, but not often; and only where the vascular action has been excited to considerable extent in the preceding course of the disease. The aspect of the patient is ghastly and hideous; the scene is closed, sometimes by violent convulsion, sometimes by gradual stagnation in the circulating mass, giving a picture of what may be termed passive death.

*Dissection.*

The appearances, in the dead bodies of the victims of the concentrated form of fever now described, differ only in degree from those last noticed. The

Head. The veins and sinuses within the head are generally filled with black blood: the cells of the lungs are completely gorged with blood—black and dissolved; the liver is generally increased in size, its substance putrid or rotten, its coat often ruptured from the distention of the interior mass; the appearances of the spleen are for the most part similar—its coats ruptured—its interior a mass of gore. The mesenteric veins are generally distended with black blood; black and grumous blood is often effused into the

Thorax.

Abdominal Cavity.



cavity of the intestinal canal, particularly into the small intestines; in a word, the blood, black and dissolved, is every where collected in the larger veins, or forms masses of gore in organs of spongy texture.

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3. I have given an outline history in the preceding pages, of febrile irritation, as manifested on the gangrenous temperament, in continued forms of fever. I shall now notice cursorily the more common appearances in forms that are more distinctly periodic. This form of disease presents itself most commonly in excessively hot weather, in wet and ill ventilated situations, or, in situations that are dry in themselves, but that are exposed to the direct current of winds which pass over noxious swamps. It is also common and aggravated at the setting in of the north winds in November, especially among persons who are stationed on heights, or on gorges between heights in the vicinity of swamps or marshy grounds. The type is most usually single tertian—anomalous and anticipating by long anticipations, frequently by anticipations of not less than ten or twelve hours:—the description that follows applies to the disease in its more aggravated form.

Periodic.

Invasion.

The cold fit, which ushers in the greater number of periodic fevers, presents itself in this with circumstances that are in some degree peculiar, viz. irregular sensation of cold, comparatively of long continuance—continuous and dead, or without the

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intervals of lively heat that belong to the intermittent of a common character. The hot fit, which establishes itself after a comparatively long interval, has also something peculiar in its nature, viz. the sensation of heat is deep and concentrated—ardent about the præcordia—not equally diffused to the surface and extremities, and not such as gives an idea of active movement in the matter of life. Pains in the loins, knees, and legs, are often excruciating, accompanied with more or less of spasm or cramp. The pain of the head is sometimes severe, irregular, shooting from part to part with rapidity; sometimes it is more fixed, obscure, and dull. The tongue is white and moist, the surface strewed with mealy patches, sometimes large, swollen, and of a leaden colour; sometimes of an appearance as if it had been parboiled. Thirst is variable—increased or deficient. Nausea and vomiting occur sometimes; the vomited matters are rarely bilious; nausea is sometimes distressing—the character different from that of common nausea,—the difference not easily defined. The body is costive—the bowels obstinate to the solicitations of purgatives; if otherwise, the stools are loose, watery, and irregular. Anxiety at the præcordia, inflation of the hypochondria, deep and heavy sighing, are common,—and among the characteristic signs of this form of disease. The countenance is dark, dingy, and livid; the eye, for the most part, protruded, glossy, and inanimate. The skin is thick,—without usual sensibility to the stimulation of blisters, or other ir-

ritation. The blood sometimes actually stagnates under the nails during the cold fit, leaving a blackness which grows out like a blemish in the course of recovery; or the extreme joints of the fingers and toes separate and fall off—as gangrened by the first impression of the diseased action.

Death sometimes takes place by convulsion or apoplexy in the first paroxysm; but, where that does not happen, the powers of life begin to emerge at a given point of progress, the pulse expands, partial and imperfect perspiration, with a remission more or less distinct ensues. The paroxysm thus terminated, returns unexpectedly before the regular hour of invasion. The blood stagnates in one or other of the more important organs—and death is the consequence; or the stagnation resolves, either of itself or through the aid of medical means, the powers of life emerge, circulation is restored, remission or intermission takes place, and recovery, either immediately or after some recurrences similar to that described, is finally effected.

Termination.

The countenance is cloudy and overcast in this form of disease, as if the patient were under the impression of some dismal passion—anger or revenge; hence the name malignant naturally attaches to it. The perspirations which terminate the paroxysm, or which mark the emergence, are not copious, warm and fluid; nor are the intermissions perfect, such as indicate a solution of disease, or as give confident prognostic of security. The fatal paroxysm is frequently ushered in by sudden qualms, or im-

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pressions of unexplicable anguish at stomach, which dissections often prove to have proceeded from stag-nations in the liver or spleen ; as it commences by sudden qualms it often terminates by convulsion, apoplexy, and coma. Jaundiced yellowness occurs sometimes ; where it does occur it is of a dark shade. The form of disease under view is a fatal one : if it terminate favourably, the febrile action assumes a new character, either as an effect of medical treat-ment, or of some accidental contingency to which the subject has been exposed.

*Dissection.*

The basis of the appearances on dissection are here the same as in the preceding, only, as the act of violence is for the most part more sudden, the marks of distention are more obvious and prominent. The

Head.      The veins and sinuses within the cavity of the cranium are distended with black blood ; the ventricles and interstices of the brain often overflow with coloured

Lungs.      or colourless fluid ; the cells of the lungs are more

Liver.      or less filled with black blood ; the liver is, for the most part, increased in size—its substance frequently a mass of gore, its coats ruptured and rotten ; the

Spleen.      spleen is sometimes three times its natural size—rot-ten, so as not to bear to be handled—its coats rup-tured—its contents not unfrequently like blood half baked in an oven.

The following cases in illustration occurred in St. Domingo, in the year 1796.

## CASE I.

*August 15th.*—King, Cape St. Nicholas Mole, 56th regiment, attacked in the night with cold and shivering, head-ache, and violent pain of the loins. The pulse is now quick and frequent, and there is a general sense of soreness over the whole body. An emetic was given immediately; the head was shaved and blistered; calomel and antimonial powder after the operation of the emetic; mercurial ointment rubbed upon the legs and thighs. Evening,—the skin cool and damp; the pain of the head less urgent. *16th.*—the head-ache severe; the pains of the loins abated; the tongue, clean, dry, and glossy; the eye clear, white, and vacant; bowels costive; calomel and mercurial frictions repeated. *17th.*—severe pains of the legs and thighs; vomiting at intervals; the pulse weak, easily compressed, and not more frequent than natural—heat moderate—frequent sighing—deep breathing—moaning—the countenance grim and cloudy—livid as in sea scurvy—the eye muddy—the gums spongy, as if from mercury;—no appearance of salivation; stimulants;—calomel and mercurial friction continued. Evening,—the tongue clean,—dry; the pulse small and confined. *18th.*—the countenance grim and dusky; the lips and teeth dry as if parched; the skin dry; the bowels open—vomits sometimes—eyes muddy,—dull; frequent sighing and deep breathing. *19th.*—the skin blue as a violet.—Died about two o'clock.—*Not opened.*

## CASE II.

*December 9th.*—Lecky, hospital corps, Croix des Cougnets, seized on the morning of the *7th* about eight o'clock with giddiness so as to fall down; severe head-ache, chilliness and other symptoms of fever. Bled (the quantity not stated); emetic immediately after the bleeding. *8th.*—very ill; no symptoms detailed; a blister to the nape of the neck;—calomel and James' powder. *9th.*—extremely restless during the night;

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pains in every part of the body,—rejects drink and medicine; breathes short as if he had not power to expand the lungs; blister applied to the stomach; distress great, but not easily described as not referable to a particular part; skin and countenance of a dingy violet colour; the tongue rough and foul; the pulse small and frequent; the skin moist and damp,—not animated and warm; strangury troublesome; bowels torpid; eye down-cast. Bled (quantity not stated); the blood flowed reluctantly, of a remarkably dark colour,—did not separate into parts—relief, or as he termed it lightness at heart. Frictions with mercurial ointment, camphorated julep—with white vitriol at intervals. The julep was grateful to the stomach; it removed the anguish and repressed the hickup and vomiting which had been troublesome. Evening,—more apparent ease; the pulse sometimes full, free, and expanding; sometimes small and confined; perspiration sometimes warm and fluid; sometimes clammy and unpleasant; the eye glossy; the tongue black but moist: beverage of imperial. 10th,—no sleep—wanderings in his slumbers,—startings; the pulse small and confined; the countenance more livid—lividness at the edges of blistered places very deep; dusky tinge of yellow about the neck; the tongue black and moist; the hypochondria tense; the breathing laborious; bowels costive,—obstinate to purgatives; the lips dry; thirst considerable; gums red as if affected by mercury; extremities cold; pulse small and weak,—not frequent; vomits sometimes; the matters vomited clear and ropy. Noon,—eight ounces of blood drawn from the arm; the blood dark in colour,—some relief,—the pulse more distinct. Evening,—three or four large black stools; no vomiting; the pulse more distinct; breathes thick; hypochondria tense. Delirious about ten,—furious,—convulsed.—Died about midnight. *Not opened.*

CASE III.

Cape Nicholas-Mole, *August 26th.*—Haig, 67th regiment, attacked on the 23rd with head-ache, languor, and faintness,—sent to the hospital. Jalap and calomel—the pulse small, con-

fined, deep or concentrated. *24th*,—somewhat easier,—slept a little, took some nourishment with indifference; the tongue neither clean nor foul; the skin cool; the countenance languid—dark and greasy; the eye glossy—pearly white. *25th*,—no material alteration. *26th*,—general uneasiness; the countenance dark—approaching to livid—the expression desponding; the eye glossy in appearance—the motions of the eye languid; the pulse small and weak—scarcely more frequent than natural; heat of the surface not increased; the skin clammy and greasy—without perspiration; nausea troublesome. Evening,—the pulse small—sunk; the countenance and lips livid—the aspect unpleasant. *27th*,—the pulse more expanded; the countenance more animated; the skin warmer; the feelings less uncomfortable. Evening,—nausea troublesome; the pulse small and sunk; the skin dry; the countenance and lips livid. *28th*,—no material alteration. *29th*,—the skin moist and cool; the pulse more expanded. Evening,—breathing difficult—threatening suffocation; pulse scarcely perceptible. Bled (the quantity not stated). *30th*,—easier; the breathing relieved; the countenance still dark; the lips dry and pale; the eye glossy—languid—inanimate. Evening,—appearances rather more promising. *31st*,—appearances more favourable; the countenance still dusky, dark, and inanimate; the pulse small and weak; the body open; the tongue somewhat dry. *September 1st*,—the eye more animated; the countenance less torpid; the tongue moist—covered with a black pellicle. Evening,—appearances of amendment. *2nd*,—coldness during the night of long continuance—no horror or rigor. Now (six o'clock),—the cold gives way to warmth generally diffused, accompanied with other symptoms of an obscure febrile paroxysm, viz. uneasiness, small and weak pulse. Evening,—slight perspiration during the day; the tongue dry—covered with a black pellicle; the general feeling more comfortable. *3rd*,—better;—the eye and countenance more cheerful; the voice stronger. *4th*,—much as yesterday. *5th*,—better. *6th*,—signs of recovery.—He finally did recover.

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## SECTION III.

*Mode of febrile Action in what is usually termed  
Phlegmatic Temperament.*

The temperament ordinarily termed phlegmatic, whether inherent in the original constitution, the product of seasons and locality, or of other less certain contingency, modifies the character of a numerous train of diseases that arise from the action of a febrile cause. It is important to the practical physician to possess some knowledge of this condition, but it is difficult to attain it. The condition of temperament is simple or complicated in the individual case; and it is moreover liable to change or fluctuate from causes that are not always appreciable. The discrimination is difficult; but, as it is useful to discriminate, I shall endeavour to ascertain the characters of the numerous fevers which move on the base of the phlegmatic temperament, perfectly aware that the degrees are various, the complications difficult, and only to be unravelled by those who in a manner domesticate with the sick, and who observe carefully in the sick apartment all the movements and changes which occur in the disease:—the characters are cognizable by the eye in inspection, they are not easily communicated to the pages of history.

Character.

The predominance of the phlegmatic temperament may be distinguished, for the most part by a



thick and torpid state of the skin—dry, or clammy and greasy—deficient in warmth and animation. The tongue is often whitish and slimy, sometimes moist, clean, and smooth, the saliva viscid and tough, often forming sordes about the teeth. The blood is comparatively little warm, not of a bright florid red ; it is sometimes of an azure colour as it flows from the vein, and exhibits, when cooled and suffered to rest, coagulated lymph on the surface in different degrees of density and compaction, sometimes smooth like jelly, sometimes firm like buff or leather.

The cause of fever, as acting on the phlegmatic base of temperament, is considered in this sketch under three conditions, viz. two extremes—mild or moderate, concentrated or aggravated ; and thirdly a form that may be termed cachectic, constituting a process of action constitutionally perverted and not limited in duration to the customary febrile period. The phlegmatic tendency is more common in some seasons of the year than in others. It prevails in certain places and districts of country to an extraordinary extent ; and, fever acting on this base, sometimes appears epidemically and acts fatally where no ostensible cause can be assigned for its appearance :—where the course is rapidly fatal, the brain or lungs are the organs principally affected.

Division.

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1. The commencement of the *slighter* degree of general fever acting on the phlegmatic base is com-

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monly marked by disagreeable sensations at stomach, viz. pain, nausea, flatulence, clamminess, unpleasant taste in the mouth, deficiency of warmth at the surface and on the extremities, long continued coldness rather than horror and shivering. The eye is dull, the vision frequently obscured, the countenance generally pale and inanimate—rarely clear and expressive. Pain of the head, a symptom common in febrile diseases, is sometimes sharp and severe, often dull,—accompanied with sensations of confusion, giddiness, and clouded perception. Together with pain of the head, there are sensations of pain in the back, in the joints and limbs, irksome oftener than acute. The pulse is frequent and small in some cases; soft, moderately full, and scarcely more frequent than natural in others; in all, it is unexpansile—without energy and force. The skin is often dry, sometimes clammy, damp, and greasy; the heat is rarely high—sometimes less high than natural on the extremities, higher than natural on the trunk of the body—rarely such as is termed animated. The tongue is more or less foul, but seldom foul to any great extent; thirst is not ordinarily much increased; the mouth is clammy—with an insipid mawkish taste; the teeth are often dry—covered with a slight pellicle or crust. Secretions and excretions are irregular—diminished for the most part,—not often increased in quantity or materially changed in kind.

Progress.

The greater number of the above symptoms appear within the first twelve hours from the time of

invasion; they ordinarily increase progressively with diurnal risings and fallings for five days, oftener for seven; at that time, a change, favourable or fatal usually takes place. The symptoms are in themselves rarely urgent, or such as occasion alarm. The tongue is generally moist, more or less foul—sometimes mealy, sometimes, but not often, rough and dry; the teeth are generally dry—their roots incrustated. Nausea is common—sharp pains at stomach and vomiting of viscid matters occur sometimes. The body is often costive; when otherwise, the evacuations are small, watery, and ineffective—rarely feculent and copious. The urinary discharge is irregular—the urine thin and crude—with loose and floating clouds. The eye and countenance are often dull—deficiently animated; the countenance is pale and pasty; the eye is clear—sometimes pearly white, sometimes lurid. The skin is thick and dry, or damp and greasy—deficiently animated, and so little sensible that the cuticle does not separate freely as irritated by epispastics, or the vesicated surface soon ceases to discharge fluid secretion. The pulse is often, but not always, more frequent than natural; it is usually regular in time—the stroke not quick and energetic. The head is often muzzy—the ideas confused. Sleep is uncertain and difficultly judged as to reality; there is often dozing without refreshment.

When things have proceeded for five days, oftener for seven, in the manner described, the action of the vascular system ordinarily begins to develop, and it

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often develops effectively, the skin relaxing, perspiration becoming free and general, and eruptions appearing about the mouth, with more or less of sediment in the urine. The foulnesses which covered the tongue, and the sordes which covered the teeth, separate and disappear entirely. Sleep refreshes; appetite for food returns, and marks of crisis become evident throughout, the disease ceasing sometimes finally, sometimes temporarily.—If the termination be not final, the symptoms recur at short intervals; they sometimes recur under a different form from that of the original; they not unfrequently assume the retrograde course. If the recurrence happen on the eighth, the new disease proceeds progressively to the fourteenth; it sometimes terminates finally on the fourteenth by regular crisis, sometimes changes form, proceeds to the twenty-first under influence of the new type; it then terminates finally, or changes and proceeds to a more distant period—subject to septenary changes throughout the whole extent of its course.

*Dissection.*

The appearances observable on dissection are ordinarily little striking. Changes in structure are obscure; they notwithstanding exist and usually present themselves under the following heads, viz. slight adhesion between the membranes which cover the brain, most conspicuous near the falx.—The changes which take place in the substance of the brain itself

are seldom discernible to the eye. If the course of the disease has been rapidly fatal, the substance is often preternaturally firm; if slow, it is often flaccid. The veins which run upon its surface are usually distended with black blood, and there is often more than the usual quantity of water in the ventricles—sometimes almost a dropsy. The omentum, the omental appendages, and the membranes which line the abdominal cavity, are dry—without superficial moisture or unctuousity. Adhesion is often observed to exist between contiguous membranes in all parts of the body. There is generally more or less of congestion or apposition of new matter in the substance of the liver—and sometimes of the lungs.

The veins which run on the surface of membranes are generally turgid, and coagulated lymph is almost always found in quantity in the cavity of the heart and larger vessels near it:—the venous blood is usually black and fluid.

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2. The base of action is the same in the *concentrated* as in the milder form; the degree is different. More or less of undefinable indisposition is felt for hours, or for days, on some occasions, previous to the formal attack; in others, the attack is sudden as a stroke of lightning—the commencement marked by giddiness, sometimes by dimness of sight, even by temporary blindness. Pain of the head, of one kind or other, is almost always among the primary symptoms; the pain is sometimes heavy and oppressive;

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sometimes acute, tensive, and scarcely supportable. Faintness is not uncommon—actual fainting occurs sometimes; nausea, disagreeable sensation at stomach, vomiting, and severe retchings are usual and often simultaneous with the first feelings of pain in the head. Pains of the loins, knees, and legs, rank among the symptoms; they are often acute, sometimes irksome and deep seated. The sensation of cold, so common at the commencement of fevers, has often in this case something peculiar in its nature; it is disagreeable, deep seated, and in a manner stationary—seldom intermixed with flushings of heat. The heat, which succeeds the cold, is slowly established; when established, it is seldom of a high degree on exterior surfaces; it is often sharp and pungent at the pit of the stomach, under the arms, and on the inside of the thighs. The skin itself is usually dry—it is withal soft and inelastic; if not dry, it is damp, greasy, and deficiently animated. The pulse is small, concentrated—without force and energy in some cases; frequent and irregular in others; and, except in deficiency of force and energy, not perceptibly changed from the pulse or ordinary health in many. The countenance is for the most part inanimate; sometimes sallow and lurid, sometimes full and bloated—without expression; the white of the eye is often dingy, sometimes of pearly whiteness;—the motion of the eye ball heavy and sluggish. The tongue is sometimes rough and white—milk white—an appearance connected with thirst and nausea; sometimes it is pale and smooth—the saliva

glutinous, ropy, and adhesive. The body is irregular, often costive, sometimes loose—the evacuations small and ineffective. The urinary discharge is scanty—the secretion sometimes in a manner suspended.

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Progress.

The above are the more prominent of the symptoms which occur during the formation of the disease. A partial moisture, with partial abatement, is usually observed at the expiration of twelve or fourteen hours, but it is seldom of long duration. The febrile action recurs in a short time; and, when it does recur, it proceeds for the most part with diurnal risings and fallings, like obscure remission and exacerbation, to a final termination—favourable or fatal. Pain of the head is sometimes severe, but not always; there is however always more or less of confusion with dulness of perception. The countenance, which was sallow, often lurid and bloated, from the commencement of the indisposition, becomes dingy and inanimate as the disease advances, sometimes more suddenly, sometimes more slowly. It is often full and torpid, fixed as a block of marble; sometimes dry and pasty; sometimes damp and greasy. The eye, dull and heavy from the beginning, gradually loses animation and lustre; if vascular action has been excited in a material degree at the early stage, its veins at the acme or decline sometimes become distended as if they had been filled by injection. The lips are usually dry and often pale, the mouth clammy, the tongue foul—sometimes dry; thirst is irregular—sometimes great, sometimes little

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urgent. Unpleasant feelings at stomach and pain upon pressure are usually present in the progressive stage; nausea is felt on some occasions, vomiting of viscid and ropy matters take place in most. Delirium is not common, but it does occur sometimes: abstraction, wandering, and forgetfulness are usual. The mind has no force of conception; and, with the appearance of sleeping, there is no actual rest. The pulse is seldom frequent as a febrile pulse; it rarely rises to one hundred strokes in a minute; it is moreover deficient in force and energy. The skin is thick and torpid—seared, not vesicated, by the application of blisters;—the body does not waste as is usual in other forms of febrile disease.

## Termination.

The disease, formed and proceeding in the manner described, attains crisis or termination at different periods of time according to its different degrees of intensity or mode of direction. In some, it terminates fatally by convulsion or coma at a very early period; in many, not until the seventh day, sometimes not until the fourteenth, or later. The fatal process sometimes advances silently, and so insidiously that the unexperienced, and even many of the experienced are taken unawares—surprised by the supervention of fatal symptoms when they apprehend no danger. The pulse in this form of disease is, for the most part, a fallacious guide. It is seldom much changed from the pulse of health, unless by marked deficiency of quickness and energy in the mode of pulsation, or by something of irregular irritation, giving the impression, on some oc-



casions, as if the artery was insulated. From a calm and uniform tenor, it ordinarily retires silently from the surface and extremities of the body, loses force and expansion throughout, intermits and finally ceases.

The skin, which was never of an ardent heat superficially, becomes cool during the subsiding stage, dry, inanimate, impervious, more resembling a dead hide than the skin of a living man: if not dry, it is damp, flaccid, inanimate—without sensibility or power of reaction. Its colour is not strictly speaking yellow as in jaundice; it is of a dingy grey, or dirty olive—somewhat similar to the colour of parts that are recovering from the injuries sustained by bruises. The appearance of the white of the eye is analogous to that of the skin; it is marcid, more like the colour of old tallow than the bright or deep orange which indicates absorbed bile: its veins are often distended—its aspect peculiarly impressive of a forlorn condition. The mind is more or less engaged, unusually firm, or rather indifferent to the approach of death in all its horrors in most cases. Hæmorrhage, or droppings of blood from the nose, ooziings of blood from the gums, frequently from the whole tract of the alimentary canal from the mouth downwards are frequent in this form and this stage of disease; and, where this form of hæmorrhage takes place, the tongue is generally rough and dry—with great thirst and a taste of sweetness in the mouth unsufferably nauseous. Nausea and unpleasant sensations at stomach prevail throughout the

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whole course of the disease: vomiting is not unusual; but it is rarely distressing or severe. The matter ejected is, for the most part, pituitous and ropy—numerous shaggy flakes float in it; clots of blood, entangled in portions of the mucous membrane, are sometimes brought up by gulping rather than by vomiting: worms make their escape by the mouth on some occasions, some living, others dead and usually of a very red colour. The body, during this stage, is usually open; the stools are, for the most part, bloody and fetid—sometimes pure blood, sometimes blood enveloped in portions of mucous membrane. The urinary discharge is usually diminished in quantity, sometimes entirely suppressed—the suppression accompanied with unavailing desire to make water without evidence of the presence of water in the bladder. The intellect is often disturbed, confused, and embarrassed, in this latter period; but delirium, properly so called, is a rare occurrence. Death is sometimes sudden—effected by convulsion; its approach is oftener gradual—the event such as may be easily comprehended from the preceding detail.

Periodic.

Besides the continued form of fever now described, the periodic fever of concentrated force, manifesting paroxysms and remissions at regular periods more or less distinct in the circumstances of their history, is by no means of rare occurrence as a form of fever acting on the phlegmatic base. The proceeding may be apprehended, in some degree, from what has been said. The exacerbation or intensity of the

paroxysm is known by oppression of the pulse; the remission by expansion and emergence. These risings and fallings occur at fixed periods;—the termination, when fatal, is usually ushered in by convulsion, and terminated by coma.

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The appearances vary in the dead body according to the nature and condition of the course—rapid or slow. If the course be rapid, terminated by convulsion or coma, marks of congestion are often conspicuous in the brain and other internal organs.—The dura mater is rarely inflamed, that is, red, as tending to suppuration or gangrene; but there are often observed strings of coagulated lymph, between it and the interior membranes, spreading extensively on the sides of the falx. The substance of the brain itself is firm, as if rendered solid by the apposition of new matter; where that is the case, there is for the most part an unusual quantity of water in the ventricles. Where the course of the disease has been protracted, the marks of adhesion are less conspicuous. The interior membranes and surface of the brain are then sometimes dry, the substance grey, flaccid, marcid, even sometimes soft and liquescent. The superficial veins are often turgid with black blood—the plexus choroides frequently a clotted mass. The ventricles contain an unusual quantity of water in most cases, particularly where the disease terminates by convulsion, or where it moves by paroxysm

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and remission; sometimes the interior of the ventricle is dry, shrivelled and parched. Coagulated lymph is often, indeed almost always found in the cavity of the heart and larger vessels;—the venous blood is then black and fluid. The membrane which lines the cavity of the abdomen is usually of a dark grey, dusky colour, the omentum and its appendages having a marcid appearance, resembling old tallow. The exterior coat of the intestines is dry and of a faded green colour, the superficial veins distended with black blood. The interior cavity contains blood effused, in some parts more than in others—but without marks of deranged structure; sometimes the inner coat is loosened—partially separated and charged with blood. The interior of the stomach is in some respects similar to the interior of the intestines. It contains, in most cases, aropy, dirty and sometimes a frothy fluid with shaggy flakes, enveloping exuded blood sometimes floating in it. The liver is sometimes distended with adventitious matter, sometimes soft and flaccid as if tending to solution—its blood black and without cohesion. The contents of the gall bladder are sometimes thin and of a dirty disagreeable colour, sometimes thick, firm and of the colour of amber or gum-arabick, sometimes black as tar. The spleen is soft and flaccid, sometimes large, rotten and ruptured. The bladder of urine is often contracted in size; its interior surface sometimes studded with clots of blood enveloped in the mucous membrane, presenting an appearance as if the point of a bloody finger had been applied to a pale surface.

Intestines.

Gall Bladder.

Spleen.

Bladder of Urine.

## CASE I.

John Adams, aged 28, of a spare habit, was seized on the 6th of *May* at eight in the evening, and admitted into the hospital on the morning of the 7th. He complained of slight headache, the pulse 82 and soft; the skin dry; the tongue furred; thirst considerable; pains in the limbs:—purgative—followed by repeated doses of calomel and James' powder. 8th,—pulse sunk so as to be scarcely perceptible; pupil insensible to light; breathing stertorous:—head blistered:—camphorated mixture with opium and ammonia.—Died about 12 at night, (little more than two days). *Opened.*—The dura mater along the whole course of the longitudinal sinus inflamed, even to gangrene; considerable effusions and extensive adhesions between the membranes of the brain; the sinous veins turgid; the ventricles full of serum; the substance of the brain itself very flaccid; the vessels of the omentum turgid; the liver remarkably hard, schirrous and of a deep yellow colour; the stomach not diseased apparently—black matter in the gall bladder.

## CASE II.

Adams, R. Artillery, aged 26, was attacked with fever on the 8th of *October*, about eleven o'clock in the forenoon, and admitted into the hospital about five in the evening. The attack was sudden, viz. sickness, vomiting, head-ache, strong and frequent pulse—with great heat. Calomel gr. x., followed by a purging draught, tepid bath: bled to 25 ounces; the blood flowed slowly and reluctantly though the orifice in the vein was large; bleeding repeated at eight in the evening—eight ounces only obtained; blister applied to the head. 9th,—no vomiting since eleven o'clock last night; cramps and pains in the limbs; two evacuations by stool; pulse still frequent; head-ache continues—the intensity diminished—the pain felt at the joining of the coronal with the sagittal suture; the skin dry; the pulse energetic;—watchfulness. Blister to the nape of the neck;—calomel and antimonial powder every fourth

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hour;—opium, camphire, and valerian in bolus every sixth hour:—vomits occasionally; skin rather moist;—effervescing draughts with ammonia; sickness,—anxiety,—fulness at stomach,—impatience of pressure,—a sense of general uneasiness not definable. Evening.—tepid bath; anodyne draught with æther. 10th,—mercurial ointment rubbed into the legs and thighs; calomel, camphire, and opium as yesterday. Evening,—vomits occasionally; head-ache continues; the pulse not energetic; skin sometimes dry, sometimes moist; no effective evacuation by stool: extract of colocynth gr. xv. 11th,—frictions; calomel and camphire internally; stimulating injections repeated at short intervals,—three were given; no evacuations by stool;—vomiting and retching—with pain and anguish;—the pulse rises. 12th,—slept during the first part of the night; several stools in the latter part of it,—nausea and vomiting abated; pulse more expansile and more connected with the system,—strong, full, and considerably frequent; frictions with mercurial ointment; calomel, camphire, and opium continued. 13th,—squeamishness every now and then—bowels open—head-ache obscure; skin warm and moist; pulse energetic; thirst considerable;—tongue white:—medicines continued. 14th,—purging in the night, or rather towards morning,—the evacuations numerous, large, and not feculent,—of a dark colour and of the consistence of jelly;—vomited twice under attempts to effect a motion downwards. The pulse small, sharp—not expansile; skin rather damp,—not animated; the tongue rather white and foul; head-ache obscure; countenance not cheerful;—a change in the form of disease obvious. 15th,—medicines continued, viz. frictions, calomel, camphire, opium with other additions occasionally. Several stools in the night, vomited frequently; the tongue foul and white; no head-ache; no pain, except a sense of pain and anguish at stomach, particularly when he is urged with desire to vomit; no sleep,—not restless; pulse not weak—  
not frequent; teeth and gums affected by mercury;—no salivation. Evening,—vomits sometimes, chiefly what he drinks, rendered ropy, with a few shaggy flakes swimming in it; skin

moist and warm ; pulse more energetic ; a feculent stool in the afternoon. 16*th*,—no sleep ; sense of inward weakness ; three or four stools in the night—dark coloured ; the vomited matters flaky and somewhat green ; tongue brown—covered by thick mucus ; obscure head-ache ; eye dull—the white part inclining to yellow ; the countenance rather livid and dark ; the pulse, considered superficially seems to be good, more correctly studied it is deficient in energy—scarcely febrile : the skin damp—not animated ;—heat nearly natural :—a feeble pustular eruption on the upper lip. 17*th*,—slept, or lay quiet the greatest part of the night ; vomited once ; several attempts on the night chair without effect ; skin dry—not animated ; pulse quick, hard, rather full—in a manner insulated, or little connected with the system : countenance dark ; tongue foul and brown ; pustular eruptions about the mouth dry—appearing as if repressed ; thirst rather urgent : relishes porter and retains it ; gums sore ;—no salivation ; has passed some blood by stool ; wanders when he dozes. 18*th*,—no sleep ; frequent fruitless attempts on the night chair ; sense of inward weakness ; countenance somewhat collapsed—not clear : the skin moist and warm ; the pulse more expanded ; the tongue more moist ; saliva about the mouth ;—no salivation. Evening,—feelings more comfortable ; skin moist ; the moisture fluid ; complexion brightens ; no vomiting ; appearances more promising ; several scabs, like eruptions, beginning to dry about the mouth and other parts of the face. 19*th*,—tolerable night ; threw up the porter which he had, for the most part, hitherto retained ; stools liquid—brown without feculence ; tongue rather moist ; no salivation ; the gums hot, red, and painful ; the pulse strong, hard, irritated, regular in time ; it gives the impression as it were insulated ; skin warm and moist ; countenance lurid ; no sign of approaching crisis. Evening,—six or eight ounces of blood were drawn from the arm,—the blood buffy in the extreme ; the coagulum firm and in small quantity ; the pulse less irritated and more connected with the system after the bleeding ; the skin moist ; the heat natural ; no salivation ; numerous pimples on the thighs where the mercurial

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ointment had been applied :—weak and weary—uncomfortable without local pain; starts when he sleeps as if slightly convulsed; æther with laudanum; fifteen grains of burnt alum every four hours. *20th*,—slept quietly and comfortably the greatest part of the night without starting or vomiting; two feculent evacuations by stool; urine in quantity; tongue moist—still thirsty; no desire for food; relishes brandy and water; eye clearer; countenance bright; skin moist—even to perspiration; pulse rather frequent and small, but energetic. About noon, rose up to the night chair, being unwilling to make use of the bed pan, fainted convulsively; recovered, but begun to breathe with labour and difficulty.—Died about eight in the evening. *Opened* next morning about seven.—The blood vessels in the brain were rather full and distended; the substance of the brain itself was more firm than usual, but no marks of local inflammation, either suppurative or adhesive, were discernible. The inner surface of the stomach, particularly near the cardiac orifice was covered with a dense villous covering, more compact than natural and of a somewhat azure colour; the membrane below, red or inflamed, speckled and streaked like patches of measles, or miliary eruption, viz. inflamed secreting surfaces tending to gangrene in some places. The small intestines, particularly the duodenum, were in a similar state with the stomach. The liver was sound; the gall bladder distended; the omentum thin—the colour rather grey and dingy.—There was no apparent congestion any where, if the unusual firmness of the brain be not deemed such; no effusion of watery fluid, and no marks of putridity.

CASE III.

*May 21st*.—A man of the 4th batallion of the 60th was sent to hospital in the morning, ill of a very violent, at least dangerous fever; he was bled largely—somewhat relieved; the pulse still strong and frequent; bled again largely in the evening; the head shaved and blistered—Calomel and colocynth—with a solution of salts;—bowels not opened; pulse frequent, quick and



obscure; skin dry;—no sleep. *22nd*,—slept a little, sweated a little, but not freely; had many evacuations by stool—according to his own account twenty or thirty; no pain or uneasiness; the pulse frequent, quick—not expansile; the lips dry; the skin not relaxed; eye and countenance clear; tongue not foul; thirst moderate. Evening,—no better; pulse frequent, small and quick; heat above natural; skin moist, but not freely so;—sighs, changes posture often; increased thirst; uneasiness at stomach. *23rd*,—uneasy in the first part of the night—vomited two or three times,—restless; a blister applied to the stomach;—thirst; pulse frequent and quick; skin now warmer and more relaxed; no critical perspiration. Evening,—sickness,—nausea; bowels very open—purged; tongue foul and white; no particular pain; pulse frequent and quick. *24th*,—slept in appearance; says he is easy and well; the pulse scarcely to be felt—obscure and indistinct; the tongue somewhat foul, but moist; the eye clear; the countenance composed; the heat natural; the respiration easy; the skin soft and moist. Evening,—the patient died at noon without delirium, convulsion, or other expression of uneasiness, except the conviction that he would die very soon. *Opened*.—No inflammation on the external surface of the dura mater; internally there were strong adhesions to the parts below, particularly near the falx, with effusions of coagulated lymph below the interior membranes. The ventricles had more than the usual quantity of fluid, but there was no unusual turgidness of the blood vessels. The right lung adhered slightly to the pleura; but the adhesion did not appear to be recent. The heart was large, and the left auricle was so filled by a firm amber-coloured coagulum, as must have almost entirely stopped the passage of the blood. The stomach contained the liquid that had been recently drank—not changed in colour;—there were some inflamed patches on the inside. The liver was large, distended with black blood—black as tar and without cohesion; the gall bladder contained black bile in considerable quantity; the intestines were sound; there was a slight tinge of yellow on the skin—not perceivable till after death.

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## CASE IV.

*September 13th.*—A young man—a sailor, on the passage from Jamaica to North-America, was seized with fever about the 2nd. He had been ill three days before I saw him; and, as there was not a lancet on board of the ship where he was, the disease pursued its course with little interruption. *5th,*—he complained of pain in the head; the pulse was febrile, frequent, concentrated, or deep seated; the skin thick, compacted, dense and dry; the heat above natural, but not high; the eye clear, but not animated; the countenance heavy; the tongue white as if meal had been spread upon it—the covering not uniform nor thick; thirst considerable;—nausea of a peculiar kind; he vomited and brought up a dead round worm of a large size; no retching; bowels torpid; no sleep. Salts were given, but did not operate;—some motions were procured by jalap and calomel; the head-ache, or heaviness of the head not relieved; no sleep; a blister to the stomach. *6th,*—blister to the neck. Towards evening, the skin became soft and moist; and, according to his own report, he sweated a little, but there were no marks of critical sweat. The skin remained thick, dense and torpid; there was no buoyancy in the pulse; the tongue was clean; the eye clear—but without animation; the thirst moderate: the purgative operated freely; no sleep; no desire for food. *8th,*—the symptoms recurred, and though paroxysms and remissions were not distinct, a type was notwithstanding observable; it was double tertian. The paroxysms were marked by languor, a disposition to sigh, increased frequency, and, at the same time, obscurity of pulse; the countenance was pale and bloated—statue-like without animation; the lips pale; the skin torpid. The remissions were known by a slight expansion of pulse, a slight moisture on the surface—not critical sweat. Delirious in the nights of the *9th* and *10th*; the countenance inanimate, fixed and pasty; the lips pale; teeth dry; tongue not foul; no complaint of pain; no sickness at stomach. He revived in the course of the day—the pulse more open and slow; feeble pustular eruption on

the chin. 11th,—worse during the night; sighs frequently and heavily; countenance dry and pasty, pale and inanimate; pulse frequent and small; heat deep seated, but not great in degree; skin dingy; pains in the hips and thighs severe in the evening; they abated after the parts were rubbed with laudanum and spirit of ammonia, some laudanum and brandy being given internally at the same time. 12th,—somewhat easier; slept towards morning; pulse more expanded; no crisis, or appearance of it; countenance inanimate; eye clear, but dull and heavy; languid in its motions:—the paroxysms known by depression and distress; the remission by emergence and somewhat of energy; all the faculties are torpid—in some manner obscured; there is no delirium. About one o'clock, seized with a paroxysm—not sensible; pulse very frequent and small; skin dry; countenance inanimate; skin of a dingy pale; teeth and lips dry; body not wasted; revived a little towards evening; sensible. 13th,—rather more animated; the pulse more expanded; the skin softer; the lips more moist and less pale; heat equal; no crisis; somewhat of more promise. About six in the evening, seized with severe excruciating pains in the hips and thighs, hurried breathing—pulse small—irregular: died about eight.—*Not opened.*

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3. A febrile cause, acting on the base of the phlegmatic temperament, pursues, as now described, a strictly febrile course, terminating favourably or fatally according to the law which influences movement in ordinary febrile diseases. There is a tendency to diseased accretion, or apposition of new parts in all the course, the effect manifested, in most instances, by agglutinations in the interior substance of organs, or by adhesions between contiguous membranes. The character of this form of

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action changes on some occasions at an early period; the agglutinating tendency resolves, and the disease terminates favourably by crisis, sometimes fatally by liquescence; sometimes the process of agglutination proceeds rapidly and irregularly; the function of one or other of the organs essential to the continuance of life is impeded or oppressed, and death takes place prematurely, that is, before the febrile act has fully developed itself. This, I trust, the reader will be able to comprehend from what has been said. What follows is less obscure, in as much as it is capable of being submitted to the inspection of the eye in all its stages.

The mode of action, included under figure 3, (*viz.* cachectic) is excited by the influence of a general febrile cause, and as such it is to be considered as a genuine febrile act. But, though febrile, its manner is peculiar, in as much as it exhibits a slow and gradual perversion of the ordinary processes of healthy organization, the course sometimes progressive—such as may be termed accretive, sometimes retrograde—such as may be termed liquescent.

## Locality.

The disease, which I consider as a cachectic form of endemic fever, is frequent in some quarters of the globe, rare in others. It is most common in countries which abound with moisture, particularly the moisture of fresh water rivers and inland lakes. It is more common in hot countries and in the hot months of summer and autumn than in cold regions and the winter season. It is thus frequent at certain times in the interior of Guyana at some dis-

tance from the sea coast; it is often observed in the vicinity of the interior lakes of North-America; it occurs in various of the islands in the West-Indies in districts that are contiguous to swamps; and, of the West-Indian islands, it is more common in Trinidad than in others. Where the cause is concentrated, the act is often retrograde from the commencement—the course rapidly fatal; where the cause is diffused, the act is what may be termed progressive; the course is tedious—protracted to months, even sometimes not terminated before the expiration of years. The type, under which the act moves, is oftener periodic than continued; this is the case, at least, where the act is progressive and its degree of force moderate.

The disease is various in its forms: I shall describe it as it has appeared to myself. It usually commences as an intermittent or remittent, and proceeds in the following manner. It moves by paroxysm and remission; but the paroxysm does not terminate by copious evacuation, viz. perspiration or purging, as the paroxysms of regular intermittents or remittents usually do. It subsides, recurs again, and again subsides, the accessions and the remissions becoming less distinct in every succeeding revolution. The cause is febrile, the effect is febrile also; the characters of the act are febrile, though not exhibited under common febrile form. The periodic, as now observed, is the more common mode under which the disease makes its first appearance, but it is not the only one. In many instances, a per-

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son, after being excessively heated and fatigued, is seized suddenly—usually under exposure to streams of cold air, with languor, faintness, thirst and other feeling of indisposition which he cannot easily describe, and which the physician is often unable to comprehend, or place correctly in his table of nosology. The pulse is frequent, quick, sharp and irritated—the movement peculiar, the order disturbed, the action accelerated to an extraordinary degree of frequency by the slightest bodily exertion. The person, so affected, often remains for eight days, a fortnight, even longer under this ill defined indisposition, which is febrile in its essence, though not characterized by the ordinary febrile signs; or not proceeding to a termination through the customary febrile channel. It establishes its own mode of perverted action throughout the whole extent of the system, appearing to change, and, in some manner, to new model the processes of organic life, sometimes generally, sometimes partially, that is more in some parts of the body than in others.\* It thus constitutes a constitutional ca-

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\* General cachexy is more common in flat countries near the banks of fresh water rivers or fresh water lakes than in other situations; but a local form of it, viz. the thickened leg, is more common in the island of Barbados, particularly among the natives than in any other of the Charibbean islands in possession of the British, in so far as I have seen. It is common at St. Thomas, and not unfrequent at St. Christopher. The malady is termed ague and fever by the inhabitants of Barbados, and it appears to be so in fact. It is in a manner eph-

chexy, or peculiar form of deranged organization which makes no effort, by the act of its own operation, to move to a defined critical termination. The duration is uncertain; sometimes it extends to years, its course being rarely arrested, or its tendency averted by the ordinary aids of the medical art.

When the first tumults of this form of disease are past, or settled into a constitutional form of deranged action, whether continued or remittent, the patient rarely complains of pain and uneasiness while he is allowed to remain in a state of rest—at least in a recumbent posture. He is unable to support himself erect for any length of time, and exertion, or attempts at exertion throw him into great agitation. The pulse is irritated—more or less sharp and quick, and hurried to excess by every exerted movement

Progress.

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meral. It ceases and recurs at uncertain periods, leaving, at every recurrence, a deposition in the cellular membrane of one or both legs, which becomes of a firm consistence—something like brawn of pork, and which, by repeated recurrences in a length of years, attains a considerable size, and, as it impairs activity, materially impairs the health of the subject. It rarely occurs to native Europeans; and, though there does not appear to be any very precise idea of its nature among medical men, it seems to me to be entitled to be considered as an expression of the action of an endemic cause of fever on a particular class of subjects.—I have not had the opportunity of dissecting, from which I could form precise opinion on the subject, but I conclude, from external examination, that the material of the thickened leg of Barbados is of the same brawny nature, as that which fills the cellular membrane in forms of general cachexy,—only perhaps more condensed.

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of the body. Thirst is almost always greater than natural—sometimes it is urgent. The tongue is usually clean, pale and smooth—often flaccid. The lips are dry and pale, the gums pale and bloodless; the nails of the fingers are also pale. The countenance is pasty, or like dough—full or bloated—often inanimate as a block of marble;—the skin is smooth, but dry, sometimes polished as if it had been under the discipline of cosmetics. The white of the eye is sometimes of a lemon yellow, oftener clear and pearly, vacant and dull—without expression or interest. Respiration is free—not hurried while the patient remains at rest; it is disturbed and hurried even to panting when he attempts to walk briskly, or to ascend a height;—the pulse then becomes so frequent—and so indistinct that it is scarcely possible to reckon it. There are here, as in most other diseases, times of greater or less uneasiness—even distinct paroxysms and remissions, at least distresses and subsidings from distress at given periods; but the subsidings are not marked by evacuation, viz. sweat or purging, as in ordinary intermittents. The appetite for food is sometimes impaired—in general not materially impaired, though often accompanied with something unusual in the mode of craving. The desire for drink, as already observed, is often increased—and thirst is sometimes considerable. The bowels perform their office irregularly, sometimes reluctantly. The urine is generally clear—of usual or increased quantity. Sleep is apparently sound and undisturbed; and animal sensibility is, for the most part, clouded and obscure.



The volume of the body does not diminish by the continuance of the disease as is usual in most forms of fever; on the contrary, it increases—sometimes gradually, sometimes rapidly. The aspect of the countenance is sometimes puffed or bloated—the flesh soft and doughy; sometimes the countenance is plump and round, without a mark of muscular indentation in any part—the flesh firmer and harder than human flesh. The cellular membrane is filled, in this case, with a substance firmer than common fat—a substance on which pressure scarcely makes impression. The whole figure is plump and round, and the aspect is complacent; in so much that, with the exception of paleness and want of animation, the health could be pronounced, on a superficial view, to be good. The appearance is specious, but deceptive. The gentlest exercise produces fatigue, accelerates the pulse to an incredible degree of frequency; and, if carried to extent, occasions hurry and agitation in the function of respiration amounting to panting and total inability. The disease goes on to increase for months, sometimes maintains itself without material increase for years; the patient is valetudinary, incapable of exertion, but does not suffer materially while he is permitted to remain at rest. At a certain point of progress, which I do not pretend to define, the diseased process attains its acme; the functions of important organs are suffocated or choaked; water is effused into cavities—and death ensues speedily as a consequence; or a retrograde process supervenes at a

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given point, and life is exhausted slowly by a melting diarrhea.

*Dissection.*

A great number of persons who died, between the years 1812 and 1814 inclusive, of the form of the disease now described, or rather of its consequences, were opened and dissected with care, either under my own eye or by my direction; the appearances noted and attached to the history of the case which was transmitted to the inspector's office at Barbados. The termination, as already observed, was commonly accompanied by dropsy or diarrhea; but, as the mode of termination was only a contingent effect of the preceding diseased course, I shall endeavour to separate and note, with as much care as I can, the appearances which had been impressed upon internal structures during the activity of the morbid progression.

Brain.

Nothing particular was observed within the cavity of the cranium, except a deluge of water in the ventricles and in all the interstices of the brain where dropsy was the ostensible cause of death.

Cellular  
Membrane.

In dividing the skin, the cellular membrane in those persons who had died suddenly, and whose cases gave a view of the changes which had been effected upon organic structures by the constitutional action of the disease, presented a singular appearance. The cells, instead of being filled with fat, were filled with a substance firmer than fat—and not unctuous. This substance occupied the cellular

membrane in every part of the body ; in the omentum and its appendages there were great depositions of it. It was more solid than fat, somewhat pellucid—not unlike softened cartilage or brawn of pork. The heart appeared by the symptoms, during the course, to sustain a great part of the action of this form of disease ; its structure was more changed in the dead body than that of any other organ. It was often twice and sometimes three times its natural size. Its substance was firm and hard—of a faint brown or pale colour—dry in some cases almost to schirrosity. The cells, or interstices between the fibres were filled with solid pellucid substance, the base of the heart particularly loaded with it. Lymph was coagulated in some of the blood vessels—and of a firm consistence ; blood—dissolved, fluid and black was collected in others. The coats of the stomach and intestines were thickened. The red fibre was absorbed ; in so much that the tube resembled, in its whole extent, a strong tube of leather—elastic and firm, but whitened as if it had been bleached by art.—The red muscular fibre was visible in no part of the body. The liver was usually much enlarged in size, often changed in structure by the apposition of new matter. The contents of the gall bladder were usually of a thin consistence, and more or less changed from the ordinary condition of bile. The spleen was sometimes increased in size, but not always.—Such were the appearances where death was sudden. Where the disease was protracted, and

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Stomach, &amp;c.

Liver.

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where death was apparently effected through a colliquative diarrhea, the coats and substance of the intestines were often in a melting and separating state; where it was effected by dropsy, every cavity and every cellular interstice was deluged with water;—the heart was sometimes preternaturally firm in one part, preternaturally soft and flaccid in another.

#### SECTION IV.

*Retrograde Form of Febrile Action on the Phlegmatic Base of Temperament, more commonly considered as Liquescent Cachexy.*

Locality.

Whether from a different degree, or different modification of cause, or a different condition of subject that is not explicable, a form of disease which acts on the same series of parts as the preceding, but which assumes a different tendency in its action, often presents itself in circumstances of locality nearly similar to those alluded to above. It presents itself most commonly in the more aggravated degree in low and champaign countries, in marshy and loose soils where water stagnates near the surface. It is more common in the vicinity of fresh water lakes and on the banks of fresh water rivers than in other situations. It is not confined to particular climates and particular latitudes; but, its appearance is more frequent, and its course more rapid in hot countries than in northern and more

temperate regions. It is thus frequent near the lakes and rivers of the hotter districts of America, not unfrequent in the islands of the West-Indies, and more frequent at Trinidad than in any of the others at present possessed by the English and garrisoned by British troops. The atmosphere of Trinidad is in a manner supersaturated with moisture; the position of the barracks is generally ill chosen for health, the mode of construction injudicious—contrived, if one may so speak, to concentrate and augment the causes of disease,—I do not say by design, but I am forced to say in ignorance, or in indifference to the nature of causes which act adversely upon health.

The cachectic mode of febrile action presents itself under a variety of appearances, some of them so unlike ordinary fever that it will be considered as an outrage to nosology to class them under that head. My own observation sufficiently convinces me that they radically depend on the operation of a febrile cause, and my experience proves to me that the destructive effect of the operation may be averted by the ordinary means which arrest the course of other fevers. On these grounds, I consider myself warranted to place them as I now do, and to sketch their history in a summary manner, the only one which the limits of this work permit.

The disease begins in some, or rather in most instances, as an intermittent. The intermittent, whether left to itself or opposed by the ordinary applications of art, ceases or subsides after a course of

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time. But, though the formal disease cease, the vigour of health does not return with the cessation. Languor, inability, a loss of colour similar to what occurs in certain conditions of the female chlorosis, leucophlegmasia and even anasarca make their appearance, and advance with more or less rapidity to a fatal termination. In some cases, the intermittent re-appears, the swellings decrease, the colour revives, and health is sometimes restored, either by change of season or by means of art; sometimes the anasarca recurs, increases rapidly and finally destroys life, either in its pure form or as complicated with diarrhea. The form of disease, here alluded to, is common among the inhabitants of aguish countries. However degenerated in appearance, it cannot be denied a place in the circle of febrile diseases:—with respect to the following there may be hesitation.

A person for instance is seized—often after fatigue and sudden exposure to streams of cold air, with listlessness, head ache, thirst, indigestion, inability to walk briskly, or to ascend a height without distress and panting for breath. The pulse, frequent and irregular at all times, is irritated and disturbed by exertion to such extent that the series of pulsations can scarcely be traced, or the number counted. Besides the hurried breathing and the extreme agitation in the pulses of the heart and arteries under motion, or the slight degree of exertion here alluded to, the countenance generally becomes pale and wan; it notwithstanding sometimes re-

tains a tinge of delicate pink colour, resembling the transient flushings observed occasionally in chlorotic females; it is always inanimate—often bloated and puffed. The lips and gums are dry and bloodless—the gums almost evanescent. The tongue is pale, generally smooth, without prominent papillæ; sometimes it is flaccid and of diminished size; it is seldom foul, or, if foul, it is clay coloured. The eye is clear—the white pearly—the expression vacant or without character. The skin is generally dry; and while dry, it is of a satin smoothness and polish—without elasticity or buoyancy when pressed by the hand. The heat of the surface is seldom high; where higher than natural, it gives a disagreeable impression to the hand which touches it, different from the impression of genial warmth or simply augmented heat. Thirst is usually increased—seldom greatly increased; but it is not easily satiated. There is little desire for food—sometimes there is an aversion. The body is ordinarily open, sometimes there is purging. The urinary discharge is irregular—scanty or profuse. Sleep is disturbed and unrefreshing;—delirium, or mental derangement is rare. The disease, as now described, sometimes terminates fatally in a fortnight; it oftener continues for months, even sometimes for several. Where the course is protracted, anasarca or diarrhea at last make their appearance, and one or other is ordinarily the ostensible cause of death.—Inaptitude to motion, agitation and palpitation of the heart, an inexpressible agony of fee-

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ling, panting for breath under the slightest degree of exertion, a sudden and unaccountable subtraction of colour and loss of elasticity are the chief characteristics.

The attack of this form of malady is sometimes sudden and the course rapid; sometimes the approach is gradual and slow—the manner insidious—the event fatal after a long distance of time and a variety of changes in the form; which, however varied, mark a consuming constitutional cachexy, depending on modified operations of an endemic febrile cause acting on a subject of a particular constitution. In this manner, it seems often to constitute the seasoning disease of Africans transported to the islands in the West-Indies, whether destined to carry the fire-lock, or to labour with the hoe.

*Dissection. .*

The appearances, observed on the dissection of those who die of what I term the liquescent form of cachectic fever, differ among themselves, in so far as the course of the disease is rapid and slow. In the first or rapid form, the substance of the brain is soft and flaccid, diminished, and, if one might so speak, melted down; the heart is pale in colour, flaccid in substance—inelastic as a bag of wool or cotton, generally diminished in size—the red muscular fibre entirely absorbed. The stomach and intestines are pale in colour—white as if they had been artificially bleached; they are sometimes dis-



tended with flatus. The liver and spleen are usually diminished in size, soft and flabby; the superficial veins are without red blood; blood, black and uncoagulated generally fills the larger vessels near the heart.—In the second or slow form, in which, as already observed, anasarca and diarrhea are ostensible causes of death, the ventricles of the brain and all its cavities and interstices are deluged with watery fluid; the cellular membrane under the skin throughout the whole extent of the body, the cavities of the thorax, pericardium and abdomen overflow with water; the heart is reduced to a small size—pale and flabby—the red fibre completely absorbed. The liver and spleen are small and collapsed—pale and flaccid; the stomach and intestines are white, as if they had been long under a process of bleaching; no red muscular fibre is discernible any where; the quantity of red blood is apparently diminished throughout the body.

## CASE I.

Grainger, a man of the West-India Rangers, lately from Martinique, and in bad health for some time past, was admitted into hospital on his arrival at Barbados. The lips were pale, the countenance void of colour, the habit plump and full, breathing hurried almost to panting under exercise—the case such as is usually called cachexy. He lingered for some time and died. *The body was opened.*—The lungs were in themselves sound; but a small quantity of water was effused into the cavity of the thorax. The pericardium was distended with water, and the heart was at least three times its natural size; the structure was somewhat changed—firmer than natural, but not preternaturally

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hard and dry; there were no ossifications nor suppurations; fatty, or rather pellucid substance, like brawn of pork, was accumulated in great quantity. The blood was black—without cohesion. The liver was sound externally: the gall bladder was white as if bleached, and the *pori biliarii* were distinguished in their dispersion through the liver by the same bleached-like appearance. The stomach was thin and pale—without a visible blood vessel; the intestinal canal was in a similar state—pale and bleached;—the peculiar kind of fat or brawn, characteristic of this form of disease, was every where abundant.

## CASE II.

M. a soldier of the York Rangers, one of the most active and able men of the corps, became indisposed about eight months since while in the island of St. Vincent. From being florid and in high health, he lost his colour and lost the power of exertion, particularly of ascending a height; he had a cough, but no expectoration. He was brought to Barbados, and has been in hospital ever since he arrived, now about five months. None of the means employed for his relief were of any permanent benefit. He died and was *opened*.—The heart was large in size—firm, even hard in substance—evidently of changed structure; the pericardium was distended with water to a great extent; the lungs adhered every where to the pleura costalis—almost inseparably on the back parts; the substance of the lungs was changed—gritty, knotty, impermeable to air in several places; the whole of the parts within the cavity of the thorax were changed in structure by something like a constitutional process. The spleen was large; the liver rough on the outside, as if carbuncled; the stomach white, as if bleached; the intestines were similar.—There was here a cachectic organization; the heart and lungs were the parts most affected;—the history is not correctly noted.

## CASE III.

Halket, of the Sappers and Miners, in ill health for some time—the commencement of the indisposition not distinctly

observed. He lost strength; the skin became smooth and soft like satin; the lips and gums pale; the tongue pale and diminished in size; the eye pearly white; diminished power of exertion; appetite indifferent; thirst considerable; attacks of febrile paroxysms occasionally—sometimes fits of purging. He sunk gradually, died, and was *opened*.—The muscular flesh generally pale; the heart diseased; the substance brown—not red—hard in one part, flabby and pale in another; the stomach and intestines white and bleached; depositions of fatty dense substance like jelly throughout the mesentery; numerous hard bodies interspersed like swelled glands.

## CASE IV.

Isle of Wight.—Cox, attacked with fever on the 26th September, 1800,—the case slight and of no more than three days duration. The appetite returned; he made no complaint and desired to go to duty; but his skin appearing smooth and polished as a wax doll, with a peculiar delicacy of colour, viz. white with mixture of pink, he was detained among the convalescents with a view to ascertain the cause of such singular appearance.—In a few days, he began to complain of thirst; his lips and tongue became pale and dry—the whole aspect such as if there were a want of red blood. He retained appetite for some time, walked about the hospital inclosure—losing strength daily. He died on the 13th of *October* and was *opened*.—The pericardium contained much water; the substance of the heart was flaccid and bloodless; the muscles every where flaccid and pale; the blood, in a manner, changed to water.

## CASE V.

*January 8th, 1814.*—Mahor, of the Royal Sappers and Miners, ill for some months of the form of disease termed cachexia. He lost colour and became short winded without cough or spitting; the lips were pale and bloodless; the tongue pale. He slept well and had ordinary appetite for food; and, when al-

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lowed to remain at rest, he complained of no pain or uneasiness, but had no wind when he attempted to walk, at least to accelerate his pace, or to ascend a height. The body was plump and round, firm and dense when handled. He took the aluminous water of the Isle of Wight—apparently with some advantage. He went to his barrack, but returned to the hospital in a few days in a worse condition than when he went out, having fever, great thirst, vomiting of every thing he took,—and latterly purging. He died and was *opened*.—The structure of the right lung was changed into something like *amadou* or touchwood, nearly if not altogether impermeable to air—no ulceration or purulency. The heart was of a solid and firm texture, pale and dry—in some degree scirrhus: the stomach white as if bleached—its coats thickened; the intestinal canal similar, resembling a thickened leather tube; the cellular membrane throughout filled with a substance like brawn of pork; the liver of an enlarged size—also the spleen; the pancreas diseased—thick, firm hard, and knotty, not unlike an ear of indian corn.

## SECTION V.

*History of Febrile Action, as manifested on the  
Base of the Serous Temperament.*

The fevers, which occur in what is termed the sanguine and phlegmatic temperaments, exhibit definable modes of action—progressive or retrograde, of various degrees of force and variously intermixed, viz. suppurative or adhesive, gangrenous or liquefcent. In the condition of habit termed serous, there are likewise peculiarities in the form of the existing action and in the mode of the termination, but they are more varied and less easily described than the preceding. The effects of the morbid action, which

proceeds under predominance of what is termed the sanguine or phlegmatic base of temperament, are generally manifested on the organic structure, and vestiges of the action are for the most part visible to the eye of the anatomist after death. The effect of morbid action in the serous, as manifested on a system of vessels which are organs of excretion, sometimes of excretions so subtle as not to be visible, leaves comparatively small vestiges on organic structure capable of being traced in the dissection of the dead body. The cause of the disease, as apparently attaching itself to the serous portion of the blood, operates changes on the serous secretions of more or less variety. The serum of the blood, as the portion of the circulating mass from which excretion is made, must be supposed to be the vehicle of acrimonies and contagions, visible or invisible. If this opinion be correct, the subsequent act may be reasonably supposed to correspond in character with the kind and quantity of the extraneous offending matter,—thus to be more varied or less definable.

Where the marks of a serous temperament, viz. a temperament connected with acrimony, obtain in the general system, whether as a consequence of weather and season, or of something still more contingent, a febrile cause, as applied to a subject so prepared, excites a febrile irritation in the whole series of vessels of serous secretion, subverts the existing balances of health and involves the life of the individual in more or less danger. The forms of action which arise under this contingency are greatly di-

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versified; but to avoid prolixity and perhaps ambiguity, I shall confine my description to the degree that may be termed concentrated.

The attack is sometimes sudden and violent, sometimes gradual and of inferior intensity. The coldness and shivering, so common at the commencement of febrile diseases, is here variable, sometimes protracted, sometimes short and light—passing rapidly and almost without notice. The head ache is often severe—sharp and lancinating throughout the whole of the head, sometimes more particularly severe at the forehead and temples. The pulse is usually frequent—for the most part quick, sharp and irritated, scarcely ever free and expansile. The skin is generally hot, the heat sharp, pungent, acrid and biting, peculiarly disagreeable and scorching. The surface of the body is ordinarily dry, harsh and unpleasant to the touch, thick—condensed and compacted in some cases as if it were thickened by the addition of adventitious matter; in others it is thin and irritable, but still dry; in many dry and marcid like a blighted vegetable leaf, particularly in relapse. If the skin be thick, it is generally deficient in sensibility, even so far deficient as not to be vesicated by the application of the strongest blisters. It regains softness and unctuousity, after the actual disease has ceased, only very slowly; it has in fact such compaction and solidity, on some occasions, as if the albuminous part of the blood were actually coagulated in the extreme vessels. In this case, the hottest of baths, or frictions

with the strongest stimulating liniments, are not sufficient to excite even a temporary moisture. I may even add that, while the skin remains constricted and impervious throughout, it not unfrequently assumes, some time before death, a green appearance like that of rancid tallow. The bowels, together with this constricted state of the skin, are generally torpid—insensible to the stimulation of the strongest purgatives; sometimes irritable—moved irregularly or by starts; the evacuations watery or vitiated; the urinary discharge is diminished or suppressed; the whole series of serous secretion is subverted and changed—irregularly suspended or increased, particularly the cutaneous secretion. Life sometimes ceases under marks of cutaneous constriction; sometimes it emerges under marks of relaxation—general or partial, sudden or gradual; sometimes the constrictions are removed—and life declines step by step under a process of colliquation. Instead of constriction there is sometimes irregular increased secretions—partial and uncertain.—The serous and the sanguine temperaments are much connected, the symptoms of the disease much mixed.

### *Dissection.*

The principal of the appearances, which present themselves on the dissection of those who die of this form of disease in the constrictive, or what may be termed the irritative state connected with irregular action, consist in the unusual dryness of all the in-

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terior cavities, in a total want of moisture andunctuosity, an unusual thickness and compactness of the skin; and frequently, where there would appear to have been irregular and fluctuating modes of action on the serous vessels of interior cavities which produce effusion, in conversion of the albuminous part of the fluids into cheesy substance like pancake or curd,—often observed on the surface of the heart or brain. The gall bladder, in this form of disease, is often filled with a liquor black as soot.

## SECTION VI.

*Retrograde—Colliquative or Liquescent.*

Instead of irregular constrictive action in the serous system of vessels, with changed or diminished secretion under the operation of a febrile cause, there sometimes occurs relaxation of a peculiar modification, viz. an excess of secretion, particularly of the cutaneous secretion, colliquation and melting of the whole body. Such mode of febrile action is sometimes epidemic—and it is then very fatal. It has not occurred to myself as an epidemic; nor has it often fallen under my notice in any form, but it has occurred often enough to convince me that such form of febrile action actually exists;—it is not rare in the relapses of contagious fever, and it is probably the form of disease which constituted the epidemic sweating sickness of England in the sixteenth century.



## CASE I.

Gibbs, a seasoned soldier, but weakly man, fatigued by watching and attending his sick master, came to the hospital on the evening of the 10th of April, 1812. He complained of head-ache, and appeared to be greatly distressed. His pulse was febrile, skin hot and dry: he was bled, but not much relieved; the orifice opened of itself about an hour after the arm was bound up, and a considerable quantity of blood was lost before the bleeding was stopped. He did not faint in consequence; but his pains and distresses did not materially abate. One blister was applied to the head, another to the stomach;—a purging bolus was given immediately and repeated at a short interval—with frequent doses of Aq. Ammon. Acet. The bolus did not operate well;—he expressed no relief;—the skin was dry and flaccid;—the aspect withered;—no sleep;—much distress with feelings of weakness;—pulse regular—not small, but without energy or expansion; the pain in the head less severe; thirst great; lips dry;—tongue not foul. 12th,—no appearance of amendment; the skin flaccid and without moisture—dingy and dry—not yellow; heat not more than natural—thirst considerable—pulse without energy—no sleep; complains of distress internally—about the præcordia,—creeps together as if he were cold. 13th,—vomited in the night in considerable quantity; in the morning, the pulse seemed to retire from the surface; it was regular—not frequent, but not easily felt; he labours much in breathing and complains much of uneasiness and distress at the præcordia; he was washed with salt and vinegar;—he appeared to be revived for a short time, but soon returned to his former state;—flaccid and withered—and without power; the pulse gradually sunk—and he died about six in the evening. *Dissection of the body.*—A considerable quantity of water under the membranes of the brain; a great deal in the ventricles; the substance of the brain itself flaccid—as if macerated; the interior of the stomach red in some places—its cavity filled with a liquor black as ink; there was also some black matter in the gall bladder.

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## CASE II.

*December 21st*,—Trousie, attacked this afternoon with symptoms of fever, viz. chilliness, head-ache, pain of the back, succeeded by heat and great irritability. *22nd*,—the pulse frequent, tense and rather full; the heat considerable—acid and pungent; the head-ache severe; thirst troublesome, but not intense; constriction of the skin—dinginess like withering. Bled to 24 ounces; relieved; the blood flowed slowly at first—more freely at last. *23rd*,—slept the whole night; head-ache removed; thirst considerable; tongue clean; skin cool; pulse less frequent—free and expansile: purgative. Evening,—body opened,—nose bled freely; skin soft and moist. *24th*,—eight or ten evacuations by stool; the pulse strong—full and expanded; little sleep; skin and countenance rather yellow. Evening.—the lips rather dry; the pulse less full and expanded. *25th*,—slept well during the night. *29th*,—recovered gradually and was discharged on the *3rd of January*.

## SECTION VII.

*Conditions of the Sentient and Intellectual System,  
which apparently modify the Action of a Febrile  
Cause.*

Besides the modes of febrile action, now described, which produce perversion of organic action, and leave obvious marks of organic derangement on the dead body, the application of a febrile cause excites, on many occasions, peculiar forms of movement in the sentient and intellectual systems, various and important in their indications, but transient and little calculable in their effects, and not easily comprehended in their nature, in as much as no traces of their

action are visible on the body after death, even to the eye of the most clear sighted anatomist. The medulla oblongata and spinal marrow appear, from the best considerations that have been given to the subject, to be the radical seat of that form of life or irritability which, diffused to every part of the organic system, regulates organic action. It manifests different force, and possesses a different tone of intensity in different parts according to constitutional but inexplicable aptitudes; and it is not perhaps of the same precise force in any two individuals of the same species on the face of the earth. It is through its instrumentality, in its various expansions, that man is connected with the physical system of nature; and, it is in consequence of causes acting in the chain of nature's great operations that its risings and fallings at diurnal, or other periods, conspicuously influence and diversify the phenomena of the febrile process. The intimate nature of the cause is impenetrable. The fact, that animal irritability, in analogy with electric influence, is sometimes superabundant, sometimes deficient, sometimes fixed or stationary, in common language torpid, sometimes fluctuating, unstable or ticklishly balanced, is open to every man's observation. It is accordingly observed that in some of the more aggravated and concentrated forms of febrile action, the matter or fund of irritability, whatever it may be, though abounding in the system to excess, is prevented from manifesting a suitable expression by artificial causes of constrict-

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tion or compression. The fact, that constriction or compression prevents expansion by an act of force, is a fair inference; for, with every reason to believe the presence of the material in the system, the customary stimulations do not, as then applied, produce the customary effect; but though the effect be withheld, the mode through which it is restrained is unknown. This constitutes one condition in the sentient system; in another, the act is produced, but it is fluctuating and unsteady, sometimes expressed by stronger, sometimes by weaker commotions, viz. violent explosions, spasms, starting—even convulsion; or in other circumstances by feeble explosions—tremors, fainting, inability to move, or to support motion—partial or general paralysis. It could not, I believe, be said in the cases alluded to, that the total quantity of the irritable power is diminished; it is evident that it is not justly balanced. But besides the conditions now mentioned, as connected with oppression or irregular balance, there are others in which the quantity would appear to be actually deficient, or so deeply latent that it cannot be excited except by the strongest powers of stimulation. The animal movements are then slow, depressed and feeble; the faculties are torpid, but the mode of action is not perverted, so as to assume a new character; consequently it cannot in strict propriety be termed diseased.

Animal irritability is the subject upon which all physical causes act, the proper balance or adjust-

ment of it therefore necessarily becomes an important and primary object of consideration with the practical physician. As the character of the febrile act is influenced and modified by the quantity and condition of the irritable principle existing at the time, it is necessary, with a view to preserve the order and consistency of morbid history, that actions which are strictly speaking organic, and which leave a permanent organic effect on the ostensible parts of the system, be separated in the historical detail, from actions which strictly belong to the sentient system, which are fluctuating and changeable, and which leave no perceivable traces behind them in the dead body. If this be not done, the historical description of febrile action will be embarrassed, as fluctuating on an uncertain base. As animal irritability belongs to fevers of all temperaments, it must be considered as the adjunct of all; and, as it is the base from which movements originate, and by which they are regulated, the regularity, order and force of the movement, as depending upon the condition of the irritable power, varies in individuals generally or organically according to its own law; but it varies in a manner we cannot explain in intelligible language.

Besides the conditions of animal irritability, which materially influence appearances under the action of a febrile cause, the condition of intellectual sensibility, modifies the febrile action in such manner, on some occasions, as greatly to obscure the usual form of expression, and materially to embarrass the

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observer. Intellectual sensibility is the instrument through which we are raised above this scene of things, through which we are conducted to the Deity or source of intellect, and through which we receive impressions—sacred and imperative, such as influence action and maintain moral conduct in order and consistence, in spite of solicitations to transgression from the multiplied appetites of animal sense. The condition of this sensibility is obscured and perverted by the operations of a febrile cause in various ways and degrees. No one, I believe, pretends to deny that the organ on which the intellectual function depends has its seat within the brain; but no one can pretend to define at what particular point in the brain that function has its seat, nor can we justly ascertain the circumstances in the organic condition which disturb the order and harmony of its action. The membranes of the brain are often deeply inflamed, even the substance of the brain itself is sometimes extensively affected; at least it is presumed that this is the case from effusions of coagulated lymph, adhesions between the membranes, formation of new parts, viz. bone, cheese-like substance, purulent matter on the surface and even in the centre of the cerebral mass, effusion of fluid into the ventricles, and such other marks of derangement in structure, as furnish evident proof that the ordinary channels of circulation could not be otherwise than changed or obstructed, notwithstanding which the intellectual function was not materially disordered during life, or disordered

only as a consequence of mechanical weight and compression. In other cases, the intellectual function is disturbed, the order of the action perverted without marks of local inflammation, or other form of local derangement that the eye of the most clear sighted anatomist can discern in dissecting the dead body. In such case, the mental derangement engrosses, or absorbs the febrile action to such extent, from the commencement, or from a certain period of the course, that no other symptom claims attention. The derangement is of different duration; sometimes it ceases suddenly, sometimes it declines by slow degrees; and it is of various shades and degrees as connected with the operation of a febrile cause. The alienation is sometimes primary and general; sometimes secondary and in a manner partial.—This condition always requires to be considered when an estimate is to be formed of the result of the febrile process; but, in all the calculations, the primary and general act, as a febrile mode, is to be carefully distinguished from the confusions and impediments which obviously arise from local pressures: these are contingent, the symptom of a symptom only.

## CASE I.

A man of the 90th Regiment was seized on the 13th of *November*, 1813, with symptoms of fever, giddiness and confusion in the head, accompanied with considerable difficulty in breathing. He was bled largely, purged with jalap and calomel and blistered on the head and neck. The blisters did not rise well; but he was so much relieved as to be considered to be in a state

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of convalescence, when he was attacked suddenly in the morning of the 17th with horrors, tremors, startings, delirium and great agitation; the pulse was frequent, hurried, irregular; the eye clear; the tongue clean. 18th,—delirious all night—tremors, startings and agitations still continue; uneasiness about the navel; desire for the night chair,—no evacuation; *borborygmi*; pulse frequent—regular, but not full; heat moderate; skin soft—not animated; giddiness in the head without pain; eye not clear or cheerful—pupil rather contracted; countenance not natural. He is sensible of his wanderings, but cannot restrain himself from wandering; he handles the bed clothes and forms them into figures as if to play with them; the tongue is moist—the bowels opened by a purgative. 19th,—troublesome during the night; no sleep; the pulse more frequent; the tremor diminished; the mental delusion strong—insists on his being allowed to go to barracks that his head may be well before he embark for America. 20th,—troublesome at night, now more composed and reasonable; complains of shooting pains about the forehead and occasional dimness of sight; the pulse more frequent than natural; the skin cool—not cold; the eye clear—the pupil rather contracted; tongue clean; relishes food. 21st,—better. 22nd,—convalescent.

CASE II.

Stewart, hospital-mate, arrived at Barbados in the early part of *February* in good health, but strongly prepossessed against the climate of the West-Indies. He was present, some days after his arrival, at the dissection of the body of a person who had died of the disease termed yellow fever, and he seemed to be disagreeably impressed at the appearance of what presented on the occasion. He complained in the course of the day of headache and other common symptoms of fever. He was bled largely and evacuated by purgatives. The fever went off; but he continued indisposed with flutterings, palpitations at heart, and something like night-mare during sleep: his mouth was clammy—his taste mawkish—and his appetite was not



good. By the end of three weeks, he recovered his spirits. He resumed his duty in the hospital, and discharged it with alacrity for eight days; when, appearing to be in a serviceable state of health, he embarked for the island of St. Christopher, being destined to serve with the 25th regiment which composed the garrison on Brimstone-hill. Mr. Stewart was prejudiced against the climate. He imagined that he smelled something sickly and uncommon in the air upon the hill; and, having occasional flutterings and agitations when he moved about, he did little of the ordinary duty; but, being present one day (Wednesday) at opening the body of a person who had died of the fever which then prevailed in the garrison, he was struck, so as to be confounded and incapable of doing any thing. He sauntered about the barrack the whole of the day, refused to go to dinner, and, being very unwell in the night, he bled himself to a large extent. In the morning early, when first I saw him, his bodily uneasiness was in a great measure removed; but he was impressed with the idea that he could not live; and, under the idea of dying, he proceeded to arrange his affairs. This he did with great correctness, manifesting an illumination of mind, in making his dispositions, apparently superior to the ordinary tenor of his character. The pulse was free, but extremely frequent; the head-ache was scarcely perceived, and there were no sensations of pain except in the epigastric region, where he felt an uneasiness that he could not describe distinctly; the tongue was clean; the eye clear; the skin moderately hot, but dry. He was not weak, that is, he rose up and lay down without help, walked about the room as a man in health. A blister was applied to the head; calomel, camphire and opium were given internally and repeated at intervals. The impression that he must inevitably die, so strong in his mind in the morning, wore off in the course of the day; the danger, when he himself lost sight of it, became evident to those who attended him. The skin remained obstinately dry, the pulse of an extraordinary frequency. He now complained of slight uneasiness in the head and of a clammy, mawkish taste in the mouth; the tongue was rather rough—not foul, but not like the tongue of a person in

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health; thirst was inconsiderable, and he was not altogether without appetite, at least he took different kinds of nourishment without seeming disgust. Friday,—the pulse of an extraordinary frequency—and not altogether distinct; the skin dry—rather dingy and withered. Saturday,—pulse not perceivable; vomits sometimes—the vomited matters somewhat dark; complains of a sweet unpleasant taste in the mouth. Died in the evening.—*The body was not opened.*

## CASE III.

*May 6th*,—B——, 96th regiment, attacked with fever of remittent form—the symptoms, moderate in force, subsided in twelve or fourteen hours. *7th*,—no fever in the morning. Evening,—fever returned—not violent. *8th*,—no fever. *9th*,—no fever. *10th*,—seized with delirium—lively and sometimes outrageous; the tongue clean; no increase of thirst—no increase of heat; takes food as if he were not sick; bowels torpid; no sleep; perfectly insane. *11th*,—continues the same; no sleep; the appearance more that of insanity than febrile delirium. *12th*,—no material difference; takes food; tongue clean; pulse not disordered. *13th*,—slept in the night—better: the insanity perfectly removed. Recovered.

## CASE IV.

*January 20th*,—N——n, R. Artillery, attacked with symptoms of fever preceded by chilliness, and accompanied with severe head-ache and distressing vomiting, or desire to vomit. Bled largely, viz. from three to four pounds,—relieved; the pulse nearly natural. *21st*,—no complaint. *22nd*,—no complaint. Evening,—seized in the afternoon with a wild,—extravagant delirium—without any previous complaint of pain or uneasiness, and without any of the ordinary symptoms of fever accompanying it. He imagines he is to be hanged in three days. *23rd*,—the mental aberration still continues; no thirst; no increase of heat; the tongue moist and clean. *24th*,—slept

during the night; complains much of weakness; pulse regular, —not frequent; heat natural; skin soft; copious evacuation by stool; tongue rather foul—not dry; eye and countenance calm; no mental aberration. Evening,—the mental aberration returned about noon. His fate he says is decided; he is to be hanged in an hour for stealing coals; but he is innocent—resigned and returns thanks for yesterday's respite; the eye and countenance are cheerful rather than melancholy; tongue cleaner than in the morning; no commotion in the pulse. 25th, —pulse regular and calm; tongue rather foul; mind still occupied with something not present; uneasiness in his bowels. Noon,—passed some blood by stool; bowels easier; ideas clear; pulse more frequent than natural. 26th,—better by his own account; the mind not sound—the mode of derangement particular; tongue clean, or only a little foul in the middle; no appetite—says he is thirsty;—he does not drink; the lips are dry; no external heat; pulse natural—perhaps deficient in energy and force—regular in time and manner. 27th,—has slept and says that he is better; but there is something *distract* in the voice and manner; the pulse is good; the heat natural; the tongue moist, but somewhat foul; evacuation by stool; skin rather damp. 28th,—has slept, according to his own account, not according to the account of the attendants; pulse more open and expanded—rather more frequent than natural; heat natural; skin soft; tongue whitish, but moist; says he is thirsty, but he drinks little; copious evacuations by stool from a purgative; ideas not clear—complains of a sense of lightness in his head. Evening,—countenance more animated—*distract* and incoherent at times; has taken some nourishment with seeming relish; pulse more expanded. 29th,—has talked incoherently during the night—melancholy and *distract*; the pulse nearly natural—rather more frequent—not hard—not energetic; the skin flaccid—not animated. Evening,—has frequent desire for the night chair without effect; complains of weakness and certain feelings of lightness and giddiness in the head.—No nourishment; pulse more frequent than natural; skin damp—not warm; countenance not cheerful. 30th,—restless

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in the night—now asleep, or appearing to sleep—languid; eye and countenance without animation—like the countenance of a corpse except in colour; complains of weakness, of giddiness of the head; griping—with a desire for the night chair; occasional nausea; the skin flaccid and damp; he says he is ill, but does not know how. *31st*,—has been quiet all night; the eye and countenance composed and calm—almost like a statue; the pulse more frequent than natural—not elastic. Evening, —the eye and countenance more animated; the voice very low; the mouth sore—with something of bad taste; has had stools; desires an egg. *February 1st*,—eye and countenance more animated; the skin warm and soft; pulse energetic; has slept and acknowledges himself to be better. Evening,—improves. *2nd*,—sleeps quietly,—better. Evening,—less satisfactory; pulse frequent,—not strong; clammy perspiration; has taken food greedily. *3rd*,—perfectly sensible; the parotid and sublingual glands swelled—the effect of mercury. *4th*,—improves; eye and countenance clear; glands swelled and gums red; no increase of saliva. *5th*,—improves; saliva about the mouth. *6th*,—improves. Recovered.

## Remark.

I have endeavoured to describe, in as clear and concise a manner as I am capable of describing, the different forms and degrees of endemic fever, in so far as the febrile act is manifested on the different conditions of habit that exist previously to the application of the morbid cause, and as it is manifested on the whole of the system on what may be termed a general base. I am aware that the attempt to discriminate fever, according to previous temperament, will be considered by many as a child of imagination. I am sensible that such distinction is not easily apprehended: it cannot be traced and appreciated without minute attention to all the condi-

tions that are connected with animal life, whether in health or in disease: but, obscure as it may be, I am convinced that it does exist, and I have proof, in my own experience, that attention to it, in all its forms and combinations, is important for directing aright the practical act of the physician. The outline of the descriptions here given is correct. I consider it as an analysis of cases taken down at the bed-side of the sick—faithfully, not skilfully made. But, while the outline feature is correct and adheres to its constitutional temperament throughout, the temperament and the feature of the consequent disease are liable to change in different manners, viz. by contingency, accident or medical treatment. One temperament changes into another, that is, the action is transferred from one series of parts to another—generally or partially. No one is perfectly pure. The blood, in which the temperament consists, is one mass of different proportions; the proportions change contingently within the total duration of the disease, and the mode of action changes occasionally at different periods from progressive to retrograde, or *vice versa*. In this manner, the sanguine and phlegmatic interchange, or exist to a certain extent in the same subject at the same time. Hence there are frequently observed, in the dead body, traces of both adhesive and suppurative inflammation; there are also observed, under favourable termination, operations that are partly expulsive and critical, partly adhesive and congestive, exhibiting indications of visceral obstruction of more or less

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extent with the actual presence of irregular and increased excretions. Besides the complications or interchanges here stated, the sanguine constitution changes into the gangrenous direct, the phlegmatic adhesive into the phlegmatic liquescent as its corresponding retrograde, the compound gangrenous into the sloughing gangrene. The febrile forms, which occur under constitutions that are radically retrograde and liquescent, sometimes assume the progressive, active and creative process which tends to favourable crisis. It also happens—and not unfrequently, that tumults and disorders in the functions of the organic system are temporarily suspended, suddenly transferred to the sentient—animal or intellectual. The sentient system is evidently the base on which all the transfers from one form of action to another move; at least its conditions influence the movements. It is moreover evident that these conditions are liable to change through the influence of circumstances which are not easily perceivable, or explicable in our present state of knowledge, and that these changes, thus effected, produce obvious modifications in the form of the disease, the nature of which we cannot always appreciate.

## CHAPTER III.

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### *Signs of Prognostic, or Estimate of Danger and Safety.*

**T**O the description of general fever given in the preceding chapter, I think it proper to add, in this place, an estimate of the import of the symptoms, or parts of the diseased action which have a direct reference to the danger or safety of the patient's life. An estimate of the import of these symptoms constitutes prognostic, considered, in this case, as supplementary of the preceding history.

Certain forms of vacillation, or rising and falling in the intensity of symptoms, are observed diurnally in almost all diseases of the febrile class; in many, the alternate paroxysms and remissions adhere to stated periods with great regularity. Of periodic forms, the quotidian or double tertian, the single tertian and the quartan are the principal. The single tertian is common in temperate climates, even in hot climates in the cooler season of the year. The

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Prognostic  
as Part of  
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double tertian—and forms of still greater complication prevail in tropical latitudes, and in unhealthy districts of temperate latitudes in the summer and autumnal months.—The form of type furnishes, in conjunction with other signs, ground for prognostic. The points of chief import, in forming the estimate, are the greater or less regularity in the times of accession; the longer or shorter duration of the paroxysm; the mode of termination of the paroxysm; the character of the remission or intermission, viz. perfect or obscure.

Anticipation.

The single tertian is the most simple of the types; and it is generally held to be the least dangerous. The observation is not unfounded; but it does not hold universally. The single tertian may be considered as the base of others. It is thus liable to complications more or less dangerous in themselves; and, exclusive of complication, it is more than any other liable to accidents during its course, viz. the occurrence of convulsion, which often precipitates into sudden death. The quartan is tedious. It is less liable, in its ordinary course, to sudden accident than the single tertian; but it more certainly lays the foundation of organic derangements which engender permanent bad health, or cachectic habit. The type, whether tertian or quartan, which adheres to its stated hour of recurrence is comparatively safe. If it anticipate by one or two hours only, nothing of importance is implied in the anticipation; if by ten or twelve, there is cause to apprehend danger. It may be observed, in this



place, that long anticipations always give suspicion of danger; hence the marks, which characterize anticipation, are to be carefully noted, so as to be discriminated from those which belong to duplication, from which an inferior degree of danger is to be apprehended. The single tertian often anticipates progressively by short anticipations to a given point, and from that point again postpones in a corresponding ratio until the disease finally ceases. A change in the hour of accession indicates, for the most part, a change in the circumstances of the disease: retardation of accession indicates diminished violence, and frequently a tendency to crisis;—the rule is general—not absolute.

The common duration of the paroxysm in the single tertian does not exceed twelve hours; if it exceed eighteen, there is cause to expect something untoward. The paroxysms of the double tertian are, for the most part, unequal in duration and unlike in force—the one beyond twelve hours, the other under ten. The longest paroxysm is usually but not always the most violent; for instance, it not unfrequently happens that the limit of its duration is narrowed, the hour of attack delayed, and the violence of the symptoms in the progressive course diminished, the duration of the short one being at the same time extended, the hour of recurrence anticipated and the actual force of symptoms increased. In such case, the paroxysm, which was the slightest and of the shortest duration at the commencement, being now the longest and the most

Duration of  
Paroxysms.

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violent, is critical of the whole disease.—The above forms are the principal and most important, but they are not sole. A triplicate tertian, or semitercian occurs not unfrequently, the paroxysms of which are so mixed with one another that there appears, at first view, to be only one long paroxysm of thirty-six hours duration. Such complicated form indicates danger—chiefly from the crowding and confusion of the paroxysms which leaves only short intermission for the exhibition of bark, the remedy which is considered by most as the surest preventative of recurrence :—the relative degrees of the danger are not easily defined.

Termination.

Where all the parts, or what are termed stages of the paroxysm, follow one another in the ordinary course of succession, and where the solution is completed in a given time by a copious, warm and fluid perspiration, the prognostic of the event is a favourable one. On the contrary, where the paroxysm subsides without sweat or other copious evacuation, viz. purging, bilious vomiting, &c. the case is suspicious—either as liable to sudden accident, or as laying the foundation of such forms of congestion in one or other of the internal organs as prognosticates imperfect recovery, viz. valetudinary existence or constitutional cachexy which terminates ultimately in dropsy.

Intermission.

Where the intermission is perfect, there is expectation of a favourable issue—not always of a speedy one. Imperfect remission, though it gives cause to apprehend imminence of danger, indicates, for the

most part, that the course of the disease will be less protracted;—it is not easy to estimate, so as to define with accuracy, the relative degrees of danger.

In proceeding to estimate the value of the signs of prognostic, it will be proper primarily to notice the various indications which arise from the form and character of the movements which obtain in the instruments of the great circulation. If the pulses of the heart and arteries be quick and energetic, free and expanded, and if they do not exceed one hundred strokes in the minute, the disease may be considered as one of a mild and open character—such as furnishes ground for prognosticating a favourable termination. On the contrary, if the pulses be less frequent than natural, regular and uniform, but tardy and sluggish in mode of contraction, defectively expanded in the time of dilatation, though such as ordinary observation scarcely distinguishes from the pulse of health, the prognostic of the event is not favourable; the condition is deceptive—the commencement torpor—the termination stagnation or gangrene.

The number of the pulses of the heart and arteries varies, in a given time, in different subjects in health; it varies extremely under disease. If the number of pulses does not exceed sixty in a minute in ordinary health, eighty may be regarded as febrile; if the number be seventy in health, ninety decidedly indicates a state of disease. If it amount to one hundred in a minute, it deserves to be called frequent; if to one hundred and thirty, very fre-

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quent. If it exceed one hundred and forty, my own perceptions are not sufficiently acute to follow it so as to reckon it with accuracy.—The mere frequency of pulse is not abstractly in itself a thing of great importance at the commencement of fever. Tumult, agitation and irregularity in the mode, viz. creeping, starting, intermitting, suppressed and obscure, arrest the attention; they indicate something peculiar—and they prepare us to look for accident, but we cannot with certainty define the kind. The hard and contracted pulse, or the irritated and oppressed pulse which struggles, if one may so speak, to overcome resistance, is especially deserving of notice;—it often precedes capillary paralysis.

The conditions of pulse now alluded are supposed to be present at the commencement of fever. They continue throughout, or they change into other modes at different periods, furnishing different indications of event according to the nature of the change. If the pulse, from frequent, irregular, contracted and hard, become comparatively slow, regular, expanded and soft, there are grounds to prognosticate a favourable termination. The rule is general, not absolute; for it sometimes happens, more especially in the concentrated forms of fever in the sanguine temperament, that the pulse becomes open, free and expanded, so modified as to give an impression that a critical perspiration is in the act of breaking out. It does not however break out; and, after the lapse of one or

two days, the force and apparent expansion of the pulse begin to decline, heat and expressions of vigour in the circulating system recede from the surface and extremities, venous paralysis ensues, accompanied; for the most part, by hæmorrhage and oozings of blood from different parts of the body—generally considered as harbingers of death. I have myself been deceived by this condition of the pulse on more occasions than one; I therefore advert to it, that others may be aware of the ambiguity of the sign. The surest mark of its fallacy seems to me to consist in a certain defectiveness in the energy and quickness of the mode of the arterial pulsation, notwithstanding its apparent force and expansion. The sign is decisively fatal where a hide-like thickness of the skin is present at the same time. In the more concentrated forms of the sanguine temperament, the pulse which, during the early period of the disease, was tumultuous, irregular and frequent, or hard and contracted, sluggish and obscure, often becomes slow, soft, full and regular, so as to be distinguished with difficulty, even by the experienced, from the pulse of a person in health. This change, as accompanied by a hide-like thickness of the skin, indicates a decided tendency to a fatal termination. It takes place most frequently about the third day; and it is the first unambiguous sign of decided fatal tendency in the concentrated form of disease termed yellow fever; hence *per contra*, febrile frequency, quickness and energy in the mode of arterial pulsation continue

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the longest to support the hopes of a favourable issue. The frequent, irregular and tumultuous pulse is not ordinarily of much import at the early stages of fever; it is otherwise at the latter period, either as indicating favourable crisis or fatal termination—the accompanying symptoms determine which of the terminations is to be expected. Where the pulse is of great frequency at late periods of fevers, where it hesitates or intermits at intervals, gangrene is generally considered as commencing. It ordinarily is so; but, intermission at every fourth or fifth stroke, without extraordinary frequency or other unusual circumstance, has often been observed by myself, if not by others, as a sign which attends crisis;—it is in fact so much so that I place confidence in it where other signs are obscure. A total suppression of pulse for the space of twelve or fourteen hours has occurred, on some occasions, within my own experience. The symptom was alarming, but it was not always a sign of approaching death. After a lapse of time, the suspension gave way, the heat returned to the surface and extremities, and the functions of life gradually resumed their activity. But where the event was thus fortunate, I must not omit to mention that respiration, during the continuance of the suspension, was calm and free, the eye and countenance serene; there was no expression of pain or anguish of any kind, and, from the whole circumstances of the case, I was induced to consider the symptom of suspension as a peculiar mode of action of the febrile

cause, influenced by a peculiar and unknown condition of the subject.

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Respiration.

The function of *respiration* is more or less disturbed by the action of a febrile cause acting generally, and the various conditions of that action are more or less indicative of the issue of the disease—favourable or fatal. Respiration is generally hurried and irregular at the commencement of fever, more particularly at the accession of the paroxysms of periodic fever. The hurried condition portends no particular danger as a temporary mode of febrile action during the tumult of invasion; at a late period, the portent of danger is great, especially if the respiration, while short and hurried, is also difficult and laborious. In the early period, and indeed through the whole course of the disease, slow respiration, interrupted and intermixed with deep fetchings and heavy sighing, indicates considerable danger. A state of calm and as it were still respiration, the expansion and contraction of the chest scarcely perceptible, especially as connected with signs of general torpor and evidence of the existence of strong febrile action, is also to be numbered among unfavourable signs,—but I cannot pretend to define the degree. The most suspicious of all the conditions of respiration, abstracted from conditions that belong to direct disorganization of the lungs, consists in a sense of stricture—a desire to expand the chest without the power to effect it, and without restraint in doing it from a sense of local pain or impediment; more especially as ac-

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accompanied by a livid or very deep crimson of the countenance, or by a dull, torpid and lurid aspect. The livid countenance belongs to the concentrated forms of the gangrenous constitution; the lurid to the phlegmatic. They both mark the existence of congestion; viz. blood in the one, coagulating lymph in the other.

## Tongue.

The signs, indicating danger, or giving assurance of safety, drawn from appearances which present in the alimentary canal from the mouth downwards, are numerous; some of them are important. The *tongue* is the part which first offers itself for examination, and it is a very essential one, in as much as it may be considered as in some degree, an index of the progress of the febrile act. If the tongue, during the early period of fever, be foul, covered with a smooth and cream coloured coat, moist, or dry in a moderate degree only, the disease is ordinarily of regular form, the expectation reasonable that it will proceed to a regular critical termination without accident. If it be rough and somewhat foul, the foulness adhering tenaciously to the surface, there is reason to believe that the course will be slow and the final crisis imperfect. If it be of a milky or mealy whiteness—uniformly so, or in patches, more particularly if it be large or swollen, and if it appear as if it were sodden or parboiled; or if it be leaden coloured—the red shining through the slight covering of white, the saliva ropy and overflowing, or clammy and scanty, the danger is considerable;—the condition



indicates a latent malignity liable to explode in fatal accident. Finally, if the tongue be pale, smooth, flaccid, collapsed or diminished in size, the danger is great—the condition liquescent—the termination rapid dissolution.

The appearance of the tongue varies in the advanced stages of fever, especially near the critical period: an estimate of its conditions contributes, in conjunction with other things, to throw light on the subject of prognostic. If the coat, or foulness which covers the surface of the tongue at the beginning and during the progress of fever, loosen and separate near a critical period, a crisis is anticipated with some confidence—not with absolute certainty; for it happens not unfrequently that, instead of final crisis, there is only, as concomitant of this appearance, a change in the nature of the symptoms, the disease assuming another form and proceeding in another circle for a period of the same, of longer, or of shorter duration than the original according to contingent circumstances. The sign, taken from the tongue, is thus fallacious as applied to the total disease; it is valid as applied to the completion of one circle of diseased movement. The tongue, in fevers of a protracted course, is often covered with a black crust or pellicle extending to the teeth and even to the lips—sometimes thick, sometimes thin, sometimes moist, sometimes dry; it indicates danger—at best a slow recovery. The tongue is sometimes clean, smooth, red, glossy or shining, often, not always, dry; the sign in-

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dicates a tedious course—even an uncertain issue. Tremor, or quivering of the tongue and other manifestations of diminished power belong to conditions of muscular action, and imply danger; they indicate nothing in particular as appearing in this organ.

## Thirst.

The sensation of *thirst* is sometimes very conspicuous, sometimes little troublesome in those who are under the influence of febrile action. The sensation of thirst is often connected with appearances of dryness, &c. in the tongue and lips. The cause is then ostensible. There is no great difficulty in forming an estimate of the danger where there is relative correspondence; but, in some instances, the tongue is rough and dry as a potsherd without distinct sensation of thirst;—the sign is unfavourable. Thirst is sometimes insatiable where the appearances of the tongue deviate little from natural. The sign indicates danger, unless the occurrence be merely a mode of action of the paroxysm of a periodic fever. If a constant desire to drink, with smacking of the lips, &c. be observed in any particular case, the patient, at the same time, drinking very little when drink is offered to him, danger is indicated; the degree of it is not easily defined.

## Food.

Aversion from, even abhorrence of food sometimes accompanies fever. It stands among the bad signs; but it is less dangerous than the indifference which swallows without appetite or desire. Depraved tastes, sensations, as if things were nauseous, loathsome and nasty, where nothing unusual is to be

seen, is ranked among unfavourable signs.—It is unfavourable to some extent ; but I do not pretend to estimate the degree.

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Vomiting.

The retention or rejection from the stomach, of what has been taken down as drink or nourishment, is one of the circumstances connected with fever which especially arrests attention, and which is actually of importance in aiding to form a correct opinion of the danger or safety of the case. The matters ejected by vomiting have much variety in appearance, and furnish a wide field for the exercise of judgment on the subject of prognostic. Nausea and vomiting are common symptoms at the commencement of most fevers, especially at the commencement of the more aggravated, whether endemic or contagious. Nausea of a singular and distressing kind, is often synchronous with the pain in the head, confusion, vertigo or stupor which mark the invasion of concentrated fever :—it is then a sign of the existence of danger. The nausea does not often in this case, amount to, or, terminate by vomiting ; if it does, the matter thrown up is rarely any other than what has been recently taken down as drink. This form of nausea consists, for the most part, in a desire to vomit without the power to effect vomiting, even without the power to retch :—the sensation is referred to the upper orifice of the stomach. It is a most irksome one ; and where it has been synchronous with the head-ache and first symptoms of invasion, inflammation tending to gangrene, or rather dark coloured points and

Nausea.

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vessels containing a thick dark coloured fluid, often present themselves about the cardia on dissection of the dead body: the cuticular and villous coat are also abraded in such case in numerous places throughout the whole interior, more especially near the upper orifice. Nausea is a symptom of more suspicious import than full and free vomiting, even than vomiting effected through severe and painful retchings. The rejection of what has been drank unchanged, or changed only by the acquisition of a mothy ropiness, indicates more danger than the ejection of yellow bile—even in great quantity. The vomitings of yellow bile are sometimes prodigious in periodic fevers,—such in fact as if the whole action of the febrile cause were exerted in augmenting the quantity or changing the quality of that secretion. Such excessive discharges of yellow bile by the mouth excite attention: they are not without import, but they do not in themselves indicate a fatal termination. There is more cause for alarm where the colour is various, viz. green or dark; or where it is of a changed consistence resembling a mess of mashed leeks or *pulse*. The nature of the matters ejected from the stomach is not unimportant as indicating the conditions and tendencies of the disease; the ejection of drink, rendered ropy and viscid by the admixture of vitiated secretion, more especially as charged with a quantity of shaggy flakes of a darker colour than the mass of the fluid, advances nearer to positive danger. It often presents itself at an early period of

Black  
Vomiting.

the concentrated form of fever, increases in quantity and viscosity in the progressive stage, and is converted in the retrograde, or decline, into black vomiting of various shades, from the deepest or inky shades of which recoveries are so rare as to be deemed prodigies. The quantity of fluid ejected from the stomach, in the late stages of some of the fevers that terminate by black vomiting, is enormously great, so far exceeding the quantity of what had been taken down in drink as if the stomach had become the outlet of all the fluids contained within the body.—These enormous discharges through the stomach are perhaps critical in the strict sense of the word; but they are fatal in effect, inasmuch as the act which produces them is subversive of the organic structure of the part through which they are made.

To the signs of danger or safety, derived from a consideration of the matters ejected from the stomach, may be added sensations of anxiety and anguish, impatience of pressure without specification of actual pain, and, above all, fidgetting or restlessness urging to constant change of place and posture without assignable cause. The last is a bad symptom. It is a common one in fevers of the gastric class in all countries; but, in the more concentrated of the fevers of the West-Indies, it gives cause to apprehend the existence of a condition which tends to such change or disorganization in the stomach as produces the matter of black vomit.

Besides vomiting, *hickup* may be considered as connected with the stomach and its functions. It

Anguish---  
Fidgetting.

Hickup.

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furnishes an indication, though a somewhat ambiguous one, of the issue of the disease. It sometimes means nothing of consequence; it sometimes indicates or accompanies crisis; and it sometimes prognosticates, with great certainty, the approach of death. An obscure and suppressed hickup, especially as succeeding pain at stomach, or accompanied with tension of the hypochondria and signs of congestion in the liver or spleen, is, for the most part, a sure prognostic of a fatal termination; on the contrary, a clear and open hickup, proceeding as it were from a strong convulsion of the diaphragm, has so often, in my own experience at least, accompanied a favourable crisis that I calculate upon it where other signs are obscure.

Alvine Evacuation.

The due, or the undue performance of the expulsive function of the alimentary canal always attracts attention in the history of fever; a just consideration of the condition of it aids materially in forming a prognostic of final issue. Where the bowels readily obey the stimulation of purgatives, and where they render effective and feculent evacuation to purgatives of ordinary power—with relief from pain and uneasiness, the prognostic is upon the whole favourable. Where the strongest purgative in the strongest dose has no effect, or no adequate effect, there is cause to apprehend danger; there is even little ground to infer safety where the evacuations, so extorted, are copious and watery, or where they are watery, small, ineffective and by starts, accompanied with a sensation of deficient expulsive power

—a sense of stricture or confinement. If this condition obtain during the early stage, copious, feculent and effective evacuation at the advanced period, augurs a favourable change. Bloody, mucous, bilious evacuations mark the prominent local action of the cause of fever;—a prognostic of the event is to be estimated in combination with other conditions of the disease. Evacuations smooth and black like tar or molasses occur frequently in the latter stages. The indication is dangerous—almost decisively fatal if the stools be small and viscous; it is less alarming if they be copious and fluid; in such case, copious fluid black evacuation often marks a mode of crisis—more particularly in certain of the gastric forms.

The *urinary secretion* is more or less affected by the action of a general febrile cause; the appearance of the secreted fluid furnishes indications respecting the progress and termination of the febrile process of considerable importance. At the commencement, and during the early stage of fever, the urine is usually pale, crude and copious, or high coloured, red and scanty. The secretion is sometimes nearly suspended in the more concentrated form of fever—not as a local action of the febrile cause, but as a part of generally suspended secretion;—the indication is inauspicious. At a certain period in the progress of most fevers, particularly the suppurative, the urine becomes thick and turbid, or it exhibits a number of floating clouds of different appearance, which, subsiding at the critical period, form a sediment which marks the actual

Urin.

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occurrence of crisis. When the urine from this state, which is that which the more ancient physicians termed coction, becomes suddenly pale and colourless, the recurrence of disease, under a new form, is indicated; the action is then transferred not unfrequently to the sentient system, there producing delirium, tremors, faintings, &c. Black urine is generally considered as indicating a high degree of danger. It is in fact a dangerous, but not uniformly a fatal indication; it sometimes accompanies crisis, particularly in gouty habits.

Animal Ex-  
citability.

A correct observation and just estimate of the degree and condition of *animal excitability* is important, in conjunction with other signs, towards forming a just opinion on the subject of prognostic in febrile diseases. The law of excitability in the animal habit, as observed above, has analogy with the law of electricity in the physical world. Besides risings and fallings at given times, it is sometimes morbidly accumulated in the whole, or in parts—sometimes latent or deficient; and sometimes, while unduly accumulated, it is seemingly fixed,—prevented from acting by the operation of an inexplicable cause of constriction; sometimes instead of being fixed, it is mobile to excess, disposed to explode, sometimes in strong and violent, sometimes in feeble and irregular explosions, through the impression of very slight causes. If the condition of excitability be equal in all parts of the system, the equality expressed by easy susceptibility of impression throughout, and consequent energetic and ef-



fective action corresponding with the impression, there are grounds to prognosticate favourably of the event. On the contrary, if susceptibility be dull or reluctant—not from defect or latency of the fund, but from morbid constriction, a favourable prognostic cannot be made with confidence; the immediate act consists in artificial oppression; the effect of the act settles in total stagnation and death. Again, if excitability be latent—dormant from defect or other change in the conditions of the cause that we do not comprehend, but in such manner that languor and depression are manifested without sensation of pain or indication of material commotion, there is no confidence in the prognostic; there are notwithstanding better expectations that it may be favourable than in the preceding case, both from the equality of the quiescent condition, and from means of relief being ordinarily better applied. Direct stimulation constitutes the remedy in both cases with the generality of practitioners. In the first, it often accelerates the fatal period; in the second, it has a tendency to favour recovery. In the first, the abstraction of three, four or more pounds of blood rarely fails, (if the abstraction be properly conducted,) to restore susceptibility, and to put things in a proper train for the reception of other applications directly restorative of health; wine, spirits, opium and others of the directly stimulant class augment, except by accident, the load of oppression and accelerate the progress of death. In the second, the abstraction of one or two pounds of blood is calcu-

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lated to bring life into immediate danger; wine, spirits, opium, æther, the application of warmth, viz. warm fomentations, warm bathing, frictions with warm and stimulating oils, if judiciously ordered and well applied, often succeed in restoring energy and in removing the actual dangers of the disease.

Besides conditions of fixity from constriction, and of latency from defect, excitability is sometimes so excessively accumulated as to manifest violent explosions, spasms, startings, convulsions, &c. from the application of very slight causes; sometimes, though not accumulated in excess, it is so ticklishly balanced as to manifest explosive effects of a different kind, viz. tremors, faintings, inability to move—even to bear to be moved; and on other occasions, suspensions of active power, viz. temporary paralysis, loss of speech, loss of the power of swallowing—and loss of command over the sphincter muscles. These appearances are dangerous and alarming; they are not absolutely and abstractedly fatal.

Intellect.

The condition of the function of the intellectual organ, more or less disturbed by the operation of the cause of fever of every denomination, is necessarily a condition of important consideration to the physician who attempts to form an estimate of final issue, whether recovery or death. The intellectual faculty comprehends the phenomena which belong to sleeping and waking, dreaming and various hallucinations which relate to perception, imagination,

memory, judgment, &c. If a person ill of fever, of whatever form or denomination that fever may be, sleep calmly and quietly at regular intervals, particularly if he be adequately refreshed by his sleep, there are grounds to augur well of the issue. On the contrary, if sleep be disturbed and unrefreshing; more especially, if sleep be totally wanting, the suspicions of danger are strong;—the positive degree of it not easy to be defined. Long watching is often followed by delirium of one form or other; but there is so much of peculiarity in the constitutions of men, in this respect, as forbids the attempt to establish a positive rule. There are many instances, in medical record, of persons who have sustained continual watching for seven or eight days, even longer, without delirium and without untoward accident either in the course or at the issue; but, though such fortunate events often occur, the grounds of suspicion of the danger still exist. Watchfulness, abstractedly as watchfulness, gives suspicion of danger; heavy drowsiness, or strong desire to sleep without the power of sleeping prognosticates an unfavourable event still more strongly.

The forms of mental hallucination are multifarious in kind, and varied in degree; but, avoiding prolixity, I shall only notice a few of the conditions that are most striking. Febrile delirium is sometimes furious, the patient outrageous and perfectly untractable. This furious state is sometimes accompanied with furious excitement in the circulating

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system, viz. strong and irritated pulses of the heart and arteries, crimson countenance, blood-shot eyes, distensive and rending pains in the head; sometimes it is accompanied with irregular and tumultuous movements of the heart and arteries without impression of increased force and energy—the eye clear, the countenance bright, tremors, startings and muscular agitation considerable—changeable and fleeting. The prognostic is unfavourable in both; the catastrophe often sudden—effected by convulsion or coma. Convulsion, stupor, or coma supervening upon delirium are generally fatal; mild delirium, after convulsion or a state of stupor, for the most part, indicates a tendency to recovery. Coma is at all times a suspicious symptom; but it is sometimes difficult to distinguish it from a species of dozing through which the patient emerges from disease. The furious delirium is more common in the periodic than in the continued forms of fever; and, where furious, the fatal termination is often precipitate—occasioned in most cases by effusion upon the brain. It is only in the more violent, and chiefly in periodic forms, that delirium presents itself as a conspicuous symptom in the earlier stages of the fevers of the West-Indies; it is not unfrequent at the more advanced periods of the mild and regular; it then sometimes becomes so prominent as to engross almost the whole febrile action, and thus, in a manner, to constitute the disease. If the febrile action be converted simply into delirium without evidence of existing inflammation, conges-

tion, effusion or other violence committed on the structure of the organ of intellect, the danger to life is not upon the whole, great, but it is not safe to attempt to calculate, so as to declare the degree. If the structure of the organ be actually violated, the chances of recovery are so uncertain that no clear opinion can be formed on the subject.—The diagnostics of the condition are obscure;—the appearances of the eye and countenance are of the most dependence, but not of certainty. For instance, a red and agitated, a wild and staring eye with excessive pain of the head, a confused and agitated countenance, inordinate pulsation of the carotid and temporal arteries, &c. are to be numbered among the signs which indicate the existence of active inflammation, or of a condition so nearly allied with it as readily to pass into it. A fixed and dull appearance of the eye, a torpid countenance, a dry and rather a pale lip—with absence of severe pain or material excitement, indicate more or less of congestion, or adhesive inflammation in the substance of the brain and interior membranes. The danger in both is great,—greatest in the last, principally perhaps as the symptoms indicate but obscurely the proper mode of cure. Delirium is sometimes continual, sometimes at intervals—the latter is the least dangerous. The mode of delirium is sometimes manifested by signs of increased excitement, the ideas lively, the imagination brilliant, the mind inexplicably enlightened, so as to display traits of knowledge almost beyond the means of ac-

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quirement; hence a person, under the influence of febrile action, sometimes speaks languages with facility of which he has only an imperfect knowledge, and of which he could scarcely at other times bring out a connected sentence. On other occasions, the mode is characterized by what may be termed depression, viz. the ideas dull, the imagination annihilated, and memory so far lost that the individual does not remember his own name, or recognize the most intimate of his former acquaintance. There is danger in both conditions—the greater degree in the last. Among the various hallucinations which present themselves during the course of fevers, a person sometimes conceives himself to be dead and actually buried; he notwithstanding lives and recovers. He sometimes also conceives himself to be dying, when external signs of death are not striking,—in this, he is seldomer deceived. He also often pronounces himself to be well, when his physician has no hope and no cause for hope:—undue confidence, philosophical firmness, or stoical indifference in late stages of concentrated fever is almost always a certain sign of death. The excited or lively mode of delirium is upon the whole less dangerous than the depressed; but singing, loud laughter, and some other kinds of joyous expression that occur now and then at late stages of fever, rank among fatal signs.

The appearance of the *eye* and countenance is ordinarily one of the first things which arrests the attention of the physician when he is introduced to

the apartment of a person ill of fever, and it is one of the most important to be studied and rightly understood by him. If the eye be calm and serene, bright and animated at the commencement of fever, there are grounds to augur favourably of the issue. If similar appearances take place at an advanced period, particularly after those of a contrary condition, a favourable termination may be expected with still greater confidence. But, though the change of condition alluded to be generally favourable, it is not so without exception. The eye for instance becomes calm, clear and bright at the commencement of local gangrene, as effected through what may be termed febrile explosion, or at the commencement of the retrograde course, which tends gradually to dissolution and death. The base of action is the same in both, viz. a change or cessation of febrile irritation—the issue, (recovery or death) different only as a contingency. If the eye be muddy and confused, turgid and prominent, agitated and wild, painful and inflamed at the commencement of fever, there is evidence of a violent disease, and reason to apprehend danger in the subsequent course. If, from the state of confusion and agitation now adverted to, it become comparatively calm and placid; and, if the veins of the *tunica albuginea* become at the same time distended as if they had been filled with coloured injection, the colour of the white changing to dusky yellow, the danger is positive, the chances of recovery so obscure as not to be calculable. If the eye roll rapidly, bear light impa-

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tiently, as from excessive irritability without the presence of actual inflammation, there is cause to apprehend an untoward event, viz. delirium, spasm, convulsion, or coma. If the motions of the eye be sluggish, its aspect torpid, dull, inanimate—without expression or meaning, there is cause for suspicion; and, if with these appearances at the early stage, the colour of the *tunica albuginea* become dingy and yellow at a certain period in the progress, and, more especially, if the veins become distended as if injected with coloured matter, the danger is declared—the chances of recovery uncertain, almost desperate. Further, if the eye be sunk, sad and downcast, as if vitality were dormant or deficient, the issue is very doubtful; the recovery, if effected, is not effected without a great deal of management on the part of the physician. If the eye be of a pearly white, prominent, vacant and unmeaning as the eye of an idiot, the danger is considerable—the condition indicative of stagnation of venous blood in the more important of the internal organs, viz. lungs, liver, or spleen. If it be prominent, pearly white, agitated and wild, or sullen and stern; or, if it roll as if in search of something absent, the danger is imminent, the condition threatens delirium, spasm or convulsion;—if yellowness supervene suddenly in such case, the event is fatal.

A yellow suffusion of the eye, as in jaundice, is a common occurrence in the fevers of warm countries, particularly of the West-Indies. It indicates a crisis, or change in the condition of the disease,



sometimes favourable, sometimes fatal. The light lemon coloured yellow is generally favourable in periodic fevers; the deep yellow—with a shade of coppery brown like a Seville orange, is generally fatal in the continued concentrated; the bright or brilliant yellow is ambiguous in most cases.

The indications of safety or danger, which are drawn from the appearances of the *countenance*, have a near analogy with those which are drawn from the appearances of the eye. If the aspect of the countenance be bright and clear, the expression animated and cheerful—serene and confident, the disease is ordinarily of a mild character—it is at least void of malignity or latent danger. Such condition is favourable at the commencement; it is frequently indicative of crisis at advanced periods. This is true as a general rule; but it is also true that a florid tint of colour, like circassian bloom, is a suspicious symptom, particularly at a late stage; it indicates the commencement of general colliquescence which tends to dissolution and death. If the visage be surcharged with colour—crimson or dark, agitated and of a distressful expression, or, if animation be impeded or suspended by a cause of constriction or compaction, the disease is violent;—sudden and untoward events may in such case be reckoned among the contingencies. Where the agitation and appearances of distress subside, the aspect becoming composed without relaxation, expansion or animation, the danger is great—the tendency to torpor and congestion declared. If the

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aspect be torpid, the features shrunk and withered as a fading leaf in autumn, or if it be full, bloated and fixed as a statue, livid as in sea scurvy, or dark like the colour of mahogany, the dangers are imminent; stagnations exist; convulsions and sudden death may be expected.

Skin and  
Tempera-  
ment.

The condition of the *skin* and its *temperature* constitutes another of the important conditions which attract the attention of the physician. It aids him materially, when duly considered, in forming an estimate of the nature of the disease while existing, and of the event that is to be expected when the course is run. If the skin of a person in fever be thin, soft, animated and sensible, the heat above natural, but not excessive, more analogous to increased general warmth than morbid ardency; and, if it be at the same time equally diffused to the surface and extremities, the disease is, for the most part void of malignity;—the condition giving ground to believe that the various steps in the febrile process, unless improperly interrupted, will be regular, and that the final event will be favourable. On the contrary, if the skin be dry, harsh and thick as if artificially compacted, or if it be dark and livid as in sea scurvy, the susceptibility so engrossed by a morbid condition, viz. strong action or constriction, as to be little sensible of irritation, blisters searing but not vesicating, or if they vesicate, the vesicated parts soon becoming dry, withered and black; and if, with this condition of the skin, the heat be concentrated or deep seated, unequally dis-

tributed in the different parts of the body—ardent on the head and trunk, and particularly at the *præcordia*—deficient, or only moderately increased at the extremities and on the extreme surface as superficially touched—caustic and disagreeable to sensation as the part is closely pressed, the disease is concentrated—not exempt from accident in its early stage, and giving no prospect of safety in its evolution. But if, from the state described, the heat decline at a certain stage in the progress, the ostensible fever subsiding, the skin increasing in thickness, compaction and torpidity, the strongest blisters only searing the surface, or the seared parts becoming black as if gangrened; and if yellowness, of the darker shade, supervene on this condition, the body becoming tawny or streaked with vibices, ecchymosis, &c. the case may be considered as fatally decided. If the skin be dry and pale, harsh, dusky, withered and shrunk at the early part of the disease; or if it be damp, greasy, dingy, marcid and torpid, so that the irritation of blisters sears but does not vesicate, or that the vesicles which may have been raised soon disappear, the skin underneath shrinking and becoming dry, the foundations of a condition are laid which tends to destruction by a regular process, if not counteracted by judicious and decisive means of treatment. Again, if the skin be pale, flaccid and dry, puffy and bloated—without elasticity or renitency; or if it be damp and greasy and flaccid, the danger is imminent—the tendency colliquescent, the issue dis-

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solution. If the body do not waste, according to the usual rule of wasting from the action of acute disease, there is cause to apprehend a dangerous or a tedious disease: if the appearance be bloated and statue-like, the prognostic is unfavourable—the issue generally fatal.

Perspira-  
tions.

Besides the indications of danger or safety, which are to be drawn from the conditions of the skin considered abstractly as skin, the nature of the secretions or excretions that are made through it often throw light on the subject of prognostic. For instance, if perspiration or sweat be warm, fluid, free, copious and universal, accompanied with a free, open, energetic and expanding pulse, there are grounds to expect a favourable issue;—the condition described is in fact often indicative of perfect crisis. On the contrary, if perspiration or sweat be cold, clammy, partial and scanty, accompanied with a frequent, small and unenergetic pulse, there are strong grounds to expect an untoward event;—the danger is imminent. If perspiration, though warm and copious, be such as is extorted through agonies of suffering under irregular local actions, rather than such as arises with general relaxation and freedom from partial constriction, there can be no confident promise of safety in the case. Sweat or perspiration is sometimes preternaturally cold, but at the same time fluid, universal and free. The circumstance is not very common; but, where it does occur, it has appeared to myself, at least, to indicate favourable, but not decisive crisis. Some-

times perspiration is copious, but viscous or adhesive; sometimes of a peculiar nauseous smell resembling that of a fish-market; the sign is inauspicious—in my own experience generally fatal.

Among cuticular signs, which furnish indication of the tendencies of fever to recovery or death, may be reckoned *pustular eruptions* which make their appearance about the mouth, at certain stages of the disease. If these eruptions appear at an early period, clustered upon the *philtrum nasi* and towards the wings of the nose, latent danger is indicated; in so far as my experience goes, sudden and untoward accidents occur frequently where this appearance is observed. If the eruption does not appear before the fifth or seventh day, and particularly if it appear upon the lips and about the corners of the mouth, rising freely and assuming the suppurative process, the prognostic is favourable: the sign in general indicates crisis. But if the eruption do not rise freely, or, if after it has risen, it soon turn hard and dry like hardened knobs with black points, or uniformly hard like iron burned blisters, the danger indicated is considerable, viz. the recovery tedious, or, after apparent recovery, relapse occurs, and death—sudden or gradual ensues. Besides pustular eruption about the mouth, large vesications, resembling the disease termed *pemphigus*, have appeared in succession on different parts of the body, about the time of crisis in several instances within my own experience.—They indicated something; I cannot pretend

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to say positively what it was. The patient recovered; even sometimes recovered so far as to resume his official duties, but relapse often occurred suddenly; and, when it did occur, it usually terminated fatally.

Local In-  
flammation  
or Gangrene.

Local inflammation, supervening at a certain stage of fever, and tending to abscess, has been often considered as critical in fever. It will be less expected that a critical effect should be ascribed to what may be termed explosion of local gangrene. It is notwithstanding sufficiently proved by experience that febrile irritations sometimes terminate in this manner. The fever ceases; death or recovery ensues according to circumstances, viz. the extent of the gangrene, or the nature of the part on which it strikes.

The signs of prognostic, here adduced, form a supplement to the preceding descriptive history of fever. Though not unknown to others, they are, as here given, entirely drawn from my own observation, and they are only stated as what is most common. Few are absolute; the greater number are relative. From the aggregate of many, as estimated separately and balanced with one another, a tolerably correct opinion may be formed of events—favourable or otherwise, where the disease proceeds in the regular organic course, where it manifests its action principally on the sentient system, the estimate of danger or safety is difficult—the inferences by no means sure. There are numerous indications among the symptoms which present

themselves in fever that forebode delirium, spasm, convulsion or coma ; but there is scarcely any one that is absolutely conclusive. Where delirium, convulsion, &c. occur, though they are all more or less dangerous according to their degrees and modes, there is no precise rule, in so far as I know, which enables us to fix the precise quantity of the danger. But, though there be generally a forewarning of the contingencies that occur in the different functions of the sentient system previously to explosion, yet accidents sometimes come suddenly as a flash of lightning, and overwhelm life by a process of proceeding not within the rules of ordinary calculation. And further, besides the accidents which happen to life through the medium of the sentient system, and which cannot be surely calculated, accidents happen in the circulating system of which we cannot attain any foreknowledge, viz. rupture of vessels in the more important organs, and sometimes clots of coagulated lymph, impacted into the heart or greater vessels so as to obstruct the passage of the blood. Instances have occurred in my own experience where this last seemed to be the direct cause of death ; the patient felt it, the physician did not see it clearly.

## CHAPTER IV.

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### *Analysis of the Order and Movement of Critical Days in Febrile Diseases.*

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**T**HE limits of the present work do not admit of entering into discussion on controverted points of medical doctrine; but, limited as the field may be, I cannot pass over the doctrine of critical days in fever without notice, in as much as the right comprehension of it is essential to a just comprehension of the history of febrile disease. It will not, I am confident, be denied by any one who has attended assiduously in sick chambers, and who has noted, with attention, the daily occurrences among febrile sick, that certain forms of fever have a disposition to terminate favourably or otherwise at certain periods of time more than at others. If this be so, it may be thought to be a matter of some importance to investigate the history of the fact carefully, with a view to ascertain the principle by which the movement is influenced, so that the physician, who often



ventures to foretell the occurrence of certain events at certain times, may be enabled to speak with comparatively little chance of error.

Hippocrates is regarded as the author of the doctrine of critical days; Galen, and the late Dr. Cullen of Edinburgh, are the most eminent among its supporters. Asclepiades among the ancients, and a numerous host of great names among the moderns combat and endeavour to overturn it; but they labour without success, in as much as they attempt to effect their purpose through ridicule rather than reasoning,—by the assumption of opinion rather than by actual observation of fact. My limits do not permit, and my inclination does not lead me to enter into the subject controversially; but, as I am desirous that what is useful may be known, I shall state, in as few words as I can, the sum of what I have observed on this subject in the course of my experience, observed, moreover, at a period when I had no knowledge of the doctrines of the learned, consequently when I may be supposed to have observed without bias. To this observation, which was made without prepossession, I shall now take leave to add a suggestion concerning the principle under which the various febrile movements are made, and by a proper interpretation of which, all the impediments, which have embarrassed the explanations which have been hitherto offered on this subject, appear, to my own apprehension, to be removed without violence.

During my residence in Jamaica, (which was from March 1774 to April 1778,) diseases of febrile

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form appeared, as superficially observed, to be disposed to terminate on some particular days more than on others; and, as the inference drawn from this observation was not in accord with the opinion of the medical men with whom I had intercourse, I was desirous to satisfy myself of the fact by the best evidence I could attain from my own experience. In prosecution of this view, I proceed to analyze some cases of fever which I had taken down in the years 1776 and 1777 without any other intention except the simple record of historical fact. Of sixty of these cases which terminated favourably, ten terminated on the third, ten on the fifth, twenty on the seventh, ten on the ninth, five on the eleventh, three on the thirteenth, and two on the seventeenth. Of nine which terminated fatally, one terminated on the sixth, one on the seventh, six on the eighth, and one on the tenth. This is the precise state of the case as it stood in the recorded notes; and, as thus stated, it furnishes strong grounds to believe that the favourable termination of fever is connected with odd days, the fatal termination with even days--by what may be deemed a general law of the system. The disease which was the subject of this record, it may be proper to remark, was the remittent fever of the district of Savanna-la-mar; the remissions were more or less obscure; the type was sometimes simple, sometimes complicated. The result of the analysis, here given, struck me strongly at the time. It in fact opened a view to the contemplation of a general principle which consti-

tuted a base, on which I formed the outline of opinion which has directed my observation on the subject of critical days ever since. The case, I may observe, was striking at Savanna-la-mar on the most superficial view; but it was not so clear and precise in ordinary presentation as it is here stated to be. The steps of critical movement in febrile diseases, I am confident to assert, are ruled by the influence of a consistent principle; but the view of that principle is not attained, and its influence brought into the field of calculation until complicated types be simplified, changes or movements in the type, whether by anticipation or retardation, noted, estimated and placed to their proper account; in short, until the calculation of time be made by the periods and revolutions of the disease, instead of the solar day of twenty four hours.—Unless this mode of calculation be adopted and kept in view through the whole course of the disease, appearances of irregularity will be so numerous, that the doctrine of critical days does not obtain a basis of consistence.

Having stated cursorily the general rule according to which calculation should be made, I shall now advert to the principal circumstances which occasionally attach to it, and which appear, on a superficial view, to subvert, or embarrass its order. If the type of the febrile disease be single tertian, the paroxysms of which do not exceed twelve hours in duration, and which neither anticipate nor retard in their accessions, the crisis is uniformly on an odd day, in whatever manner the time may be

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calculated; but, if instead of regularity in the hour of accession, the type anticipate, and the sum of the anticipations amount in the total duration of the disease to twenty-four or upwards, the crisis necessarily falls within the even day if the time be reckoned by the natural day of twenty-four hours; still on an odd day, if reckoned by the periodic revolutions of the disease. In like manner, if the type retard, and if the duration of the paroxysm extend to, or exceed twenty-four hours, the crisis or final termination falls upon an even day, if the time be reckoned by the solar day,—on an odd day, if reckoned according to the revolutions of the type.—This however is a case which rarely happens.

What is now said is easily comprehended. It is in no degree ambiguous; but, as there are irregularities in complicated types, there occasionally occur difficulties, in separating and disentangling the complications from each other for the purpose of attaining a just view of the truth. The double or duplicate tertian, by whatever name it may be called, may be said to consist of two forms of disease which would appear to have arisen from two separate impressions of a similar cause, at least which run a course separate from and independent of each other. If the disease which begins on the odd day be critical of the whole, that is, if the paroxysm of the odd day terminate the whole series of the morbid action, the crisis is necessarily on an odd day; but if the form of disease, which commences on the second day, or any other even day, consist of an equal

number of paroxysms with the first, or if it continue after the first has ceased, the crisis is necessarily on an even day, reckoning from the first paroxysm of the whole indisposition, on an odd day, reckoning from the invasion of the second or complicating fever. It was the observation of this fact which first suggested to me the idea of simplifying complicated types, and of calculating critical days by periods or revolutions, instead of natural or solar days of twenty-four hours. The idea, however fanciful it may be deemed by some, is founded in truth; and I may add that, if the fact of the existence of separate impressions, and separate courses of disease be admitted as a possibility, a basis is laid on which all the doubts and ambiguities observed in the order of critical days of complicated types admit of easy explanation.—To what is now said on the subject of complication, I may add that the termination of fevers of the quotidian type is almost always on an odd day, as also the crisis of those which are still more directly continued,—a fact noticed by several writers, and particularly enforced by the Arabian physician Avicenna.

The rule to be adopted, in calculating the movements of critical days in fever is clear and precise, as now explained. There is little exception in so far as respects fevers of the periodic type; one however requires to be mentioned in this place, viz. that fevers, sometimes of remittent, sometimes of continued form, terminate on some occasions late on the sixth, or rather very early on the seventh.

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Where this is the case, the paroxysm which brings the crisis is different from the preceding—often violent, alarming and altogether of a new form. Instead of anticipation of the customary paroxysm, there is accession of something new and different;—the mode of termination resembles, for the most part, the mode of termination of the ephemeral fever termed *wæed*.—The circumstance now stated embarrasses the doctrine of critical days according to superficial appearance; but if it be considered as a contingency, or extra accession, which it in fact is, the stability of the fundamental law, which I have endeavoured to establish, is not affected.

The return of the paroxysms of periodic fevers earlier or later than the usual hour is a circumstance, as just now stated, which, together with complication of type, apparently disturbs the order of the regular days of crisis. Besides this, there is another cause of apparent irregularity, important to be understood, but which, in so far as I know, has not been duly estimated by any one. In fevers, more approaching to the continued than remittent form, an obvious change often takes place in the nature of the symptoms, or mode of action of the febrile cause on the seventh day, or before it. It happens, not unfrequently, that the order of critical days is disturbed in consequence of this change, in such manner as to bring into doubt the stability of the rules in which physicians believe, and which I have endeavoured to trace to a basis constituted on a fundamental law of nature. It is a fact, which

cannot well have escaped the observation of physicians who condescend to observe facts, that there is apparently less regularity in the critical movements of fever after the seventh day than prior to that period. It is also obvious to observation, and the fact has been ascertained by much experience, that the relapsed fever has a tendency to run over a course of equal duration with the original. To this I am enabled to add that, not only relapse in direct form, but that such change in the nature of the symptoms, as indicates that the force of the morbid action has suffered transfer from one series of parts to another, continues to act on that series for a given space of time—usually equal in duration to the primary mode of action. In this manner, if a remarkable change of symptoms happen on the fifth, a crisis occurs on the ninth, sometimes another change occurs on the ninth, the final crisis not taking place until after another period of five days, sometimes not until after several successive changes at the same quinary period. It is further, and perhaps still more frequently observed that a change of symptoms, on the seventh, is followed by a crisis on the thirteenth, sometimes by another change on the thirteenth, the disease revolving through several septenary revolutions before it finally terminate. That such changes actually do take place at certain periods, I consider as a point as well established as most of the points which relate to the order of animal economy. It is confirmed, not only by the history of those cases of fever which

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have occurred in my own experience, but by an analysis of those which are recorded in the books of epidemics ascribed to Hippocrates, and, I may add, by the history of all cases that are so distinctly related in the writings of others as to admit of being distinctly traced. The rule, I may venture to say, holds in every instance, where the history of the disease is so circumstantially given that its progress can be seen from day to day, and, I may add, that if the order of the final day of crisis deviate from the rule here laid down, a change of symptoms, often an evident renewal, or recurrence of the disease after temporary cessation, will be found to have actually taken place at some period of the preceding course. Hence, if the change of symptoms happen on the odd day, the odd days continue to be critical as if no change had been; but, if the paroxysm of the odd day complete its course, an interval or respite from the diseased action, more or less perfect and of longer or shorter duration, is observed to occur; and, thus occurring, it may be considered as marking a period of change in the history of the disease, in some respects approaching to an imperfect crisis. On the following day, which is an even day, as dating from the commencement of the indisposition, a fever recurs distinguished by a train of symptoms different from that which had just ceased; and which, though different in symptoms, generally runs a course of equal duration with the preceding. If the change in the nature of the symptoms alluded to happen on the sixth,



another change or crisis is not to be expected before the tenth, which is the second fifth; if it happen on the eighth, it is not expected before the fourteenth, which is a second seventh. Relapses have, as now observed, a general tendency to run a course of the same duration as the original; but the rule is not without many exceptions. In fevers of a protracted course, more especially in such as derive their origin from the infected air of jails and crowded hospitals, the changes here alluded to are ordinarily at septenary periods during the early part of the indisposition, frequently at quinary, or even shorter periods towards the decline, especially where the powers of the system develop and eliminate, if one may so speak, the cause of the disease by repeated explosions.

The facts now stated sufficiently illustrate the opinion, as it appears to myself, that the irregularities, observed in the order of critical days, do not depend on caprice or irregularity in the movements of nature, but on our own mode of making observation, viz. in our neglecting to calculate the time by the revolution of types in periodical fevers, or in omitting to estimate the changes which occur at septenary or other periods in those that are more continued. To this I may add, (as the case might not perhaps be supposed to be comprehended within the rule here given for the explanation of irregularities) that fever, commences under continued form, changes at a certain period of the course, sometimes the third day, and sometimes the fifth, into distinct re-

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mittent or intermittent. The first paroxysm of the changed disease occurs on an even day, viz. the fourth or sixth, and, retaining its periodic form, it terminates on an even day, dating from the commencement of the whole indisposition, on an odd day, dating from the commencement of the remitting or intermitting type. This is one case which occasions an apparent irregularity; there is also another which requires to be noticed in this place, viz. complications of type, which happening at various distances of time, sometimes terminate sooner, sometimes continue longer than the original disease; and, as the one or other of these takes place, the constituted order of the critical days appears regular or embarrassed. Besides this, an extra paroxysm of a new and unusual form sometimes, as already observed, seems to be accumulated upon the existing disease; and, as thus accumulated, appears to disturb the order of the critical days according to the more usual tenor of proceeding.

The facts now stated are, in my opinion, sufficient, if properly understood, to open a view to the comprehension of the causes which influence appearances in the critical days of fevers, where crisis is clear and decisive; but, as it sometimes happens that fevers terminate without marks of crisis that are sufficiently distinct to be accurately traced, it is then difficult, or impossible to speak positively as to the order or pre-eminence of particular days. In some instances, the patient emerges from the disease so imperceptibly that the most discerning observer can

scarcely consider himself safe in venturing to give a date to the commencement of the change. I have myself at least been in suspense on this head not unfrequently ; but I may add at the same time that, wherever I was able to trace and calculate, I always found that the order of the days of crisis was such as I have endeavoured to shew that it should be, or that it was disturbed and obscured by one or other of the circumstances to which I have adverted.

The facts I have stated are distinct, and the rules I have endeavoured to establish on the facts result from the analysis of a great number of cases of fever that have fallen under my observation in a course of long experience. The explanation I have endeavoured to give of the irregularities which occur is, according to my best belief, founded in a law of nature. As such it is true ; and, if true, it may be expected by the reader that I should endeavour to give a view of the general base on which the law may be supposed to rest. It is a fact, which will not be disputed by any person who has attended minutely to the commencement and progress of febrile diseases, that a tertian type prevails generally in all forms of intermitting and remitting fever ; and further that changes occur at septenary periods in such as are more continued, occurring, moreover, regularly and, for the most part, so distinctly that they may be considered as constituting a general law of the animal system. The existence of the causes now stated give a general prevalence to the occurrence of termination on odd days ; for, as is

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commonly known, the termination follows the solution of the paroxysm which happens on an odd day in forms of the simple tertian; and on an odd day also, viz. fifth, seventh, &c. in those which are more directly continued. This explains the fact to a certain extent; but, as types are complicated, and as changes happen in the form and mode of action of various fevers without total cessation, the complication, if we wish to maintain the consistency of the rule, necessarily requires to be calculated singly, or on its own base;—the point of change to be considered as the commencement of a new form which completes its circle in its own period of time.—The circumstances now stated, together with the allowances that are sometimes necessary to be made for the anticipation or retardation of type, and, on some rare occasions, for contingent or unusual accessions of febrile recurrence, remove difficulties and leave the law of critical days on a basis which is inherent in the constitution of the animal body. The irregularities alluded to are contingencies, not in the rule, but ingrafted on the rule by accident; the rule is universal, and it is consistent as constitutional. It is important that it be understood by the practical physician; for it is the beacon which directs his course among rocks and quick sands, and from which he prognosticates events with confidence.

The pre-eminence of certain days, in influencing the critical termination of fevers, depends ostensibly on the existence of particular forms or types, viz. on the prevalence of the tertian type, or on the evo-

lution of circles of febrile action at septenary or other periods. The fact, as fact, is clear; the basis of the law on which it depends is more obscure, so obscure indeed that we never perhaps can expect to ascertain its nature. The animal system experiences, according to the constitution of its organization, a perpetual movement among its constituent parts, viz. apposition and absorption, or formation of what is new and suitable, and subtraction of what is old and unfit; and, besides the unceasing change among the organic parts now alluded to, the material of life, which pervades the whole machine and which is constitutionally more buoyant in some parts than in others, has different degrees of facility of expression at different periods of time, so as to be excited into energetic action at one occasion with the application of an apparently slight cause, at another scarcely to be moved to action of necessary effect by the strongest. The disease, termed fever, may be said to consist in actions, perverted in one manner or other from the force and order of what is natural and essential to health. Every form of action, which is unnatural, is subversive of the fundamental constitution of the system, and, as such, it cannot be of long duration. It runs a circle, and, having completed the circle, it ceases or subsides. If the channels, in which the healthy action moves, be left open at the period of cessation, the healthy act is resumed, that is, the original movement is restored; on the contrary, if the channels be obstructed or overwhelmed by the

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effects of the diseased action during the violence of its course, the vital process is impeded or suppressed, and death takes place prematurely. This is common,—and it is comprehensible enough in the more acute forms of febrile diseases; in the slower and more protracted, the processes of apposition and absorption are more gradually vitiated, and, as vitiated, but not immediately inefficient to the act of life, they engender a vitiated organization, engraft a cachectic habit on animal action, implying valetudinary health and abridging the term of physical existence. These forms of action, whether acute or slow, require measured portions of time for development. The period, within which this portion of time is comprehended, has its base in the general constitution of things, and manifests its influence according to the form of a general rule. The morbid act ceases in many cases with a distinct product arising from the obvious development of the morbid process; in others, the product is less visible, the relation between the morbid cause and the subject is only slowly and silently dissevered, and health is only slowly and almost imperceptibly restored. The critical processes are notwithstanding accomplished in both cases at given periods, or in given portions of time, the limit of the duration appearing to be generally determined by the force of the cause, and the existing condition of the general irritability, combined with the structure of the part, or series of parts upon which the force of the action is principally mani-

fested. Where the action, consequent to the application of the morbid cause, is strong, the course of the disease is ordinarily rapid, the product soon completed, whether the effect be fatal or otherwise. Where the action is weak from the inferior force of cause, or where it is manifested upon structures that are less immediately necessary to life, that are obtuse in sensibility, or of a low degree of irritability, the course is often slow, the termination in most instances gradual, whether it be favourable or fatal. The change or termination is however in all these cases, as already observed, under the influence of a law in the system which acts periodically, but which acts in a manner that we do not comprehend. We only note the fact; and it is a fact, which frequently presents itself to observation that, if an impression be made upon the system by the action of a morbid cause, and if the forward course of that action be arrested by the application of strong measures, the effect of the original impression, notwithstanding this forcible effect, still remains so as to impede the healthy actions of the system in a greater or lesser degree, until perfect solution take place under the influence of a known critical period. For example, if a febrile disease of the major degree of violence be arrested, the progressive course checked by abstraction of blood or other means, the disease may be said to cease, but the action of health is rarely effective in all the functions of the system before the third, fifth, and sometimes the seventh day from the date of the first

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attack. These are known critical days; and, it is at those periods principally that changes are observed to take place in the form and character of febrile diseases, whether partial or general, temporary or permanent. They are observed independently of the operation of medical means; and it is also observed that, where the means of art have checked the course, the influence of the critical period accomplishes or completes the cure. This fact is prominent in almost every detailed history of fever; and it seems to prove that the actions, which are reversive to health, depend essentially on a law in the system, active at one time, comparatively dormant at another.



## CHAPTER V.

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### *Proximate Cause of Fever.*

**T**HE human body consists of various organs of different configuration, and of different degrees of irritability, destined for the performance of different functions, and connected in a series for one end and purpose, viz. the support of individual life and the propagation of the species. The parts or organs, though various in kind, are all stimulated to functionary action, maintained in efficiency, or perverted from their customary course by causes which act generally on all, contingently on some more than on others. Besides the different degrees of sensibility, irritability or vitality, (by which ever name it may be called) of the different parts or organs of the system according to original constitution, there appear to be diurnal, or other periods of time at which the irritability alluded to rises higher or falls lower, in a degree that is perceptible, but after a manner that is not explicable in our limited state of

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knowledge. The act in which life consists is moved by external stimulation. The cause of the stimulation is diffused universally over the surface of the earth. It varies, as concentrated or diffused by circumstances which augment or diminish its energy. It is occasionally impregnated with extra substances which irritate, and which thus irritating, pervert or annul the healthy action of the system. The irritable power of the animal body, impressed by the impulse of adventitious causes, viz. the cause of fever, manifests action corresponding with the quality of the cause applied, sometimes manifested generally and equally, sometimes locally and irregularly. The action thus produced, completes its circle and subsides. The susceptibility to impression, which is lost under the continuance of the action produced by the impression, recovers its impressible condition when the act, resulting from the application of the stimulus, completes its course. From this pause or state of rest, the action is again renewed; it completes its circle, and it again ceases. Thus action and rest, and rest and action relieve each other alternately through a series—in health or in disease. The health of the system, that is, the integrity and vigour of all its functions, consists in alternate action and rest of just force and just cadence. The alternations may be accelerated or retarded in time, increased or diminished in force without implying such subversion of the base of the action as constitutes disease. This occurs daily and is easily comprehended; but it may be added further that, if the

cause which moves the act err greatly in quantity by excess or defect, if it be impregnated with things that are extraneous and noxious by irritation, or if it be deficient of those which stimulate to the form of action which is essential to health, the cadence and force of the effect are not simply augmented or diminished; they are disturbed in their order, the base of the action is subverted, a new form is induced, and new, or unnatural products are brought into existence as a consequence of a process thus artificially excited. Morbid actions differ in appearance according to the nature of the organ, or series of parts on which they are principally manifested, and according to contingent conditions in the habit of the individual who is the subject of them. The forms differ; but the shades of difference, though multifarious, are all comprehended under two general outlines, viz. creative processes of different modes of union and new production, or annihilative processes of different modes of disunion and disorganization. To one or other of these, the first act of the febrile cause may be referred; but to which ever of them it may belong, it implies the subversion of the customary action of health.—The view of the physician in curing disease is confined within the limit of subversion. The act of subversion, consequent to the application of the morbid cause, is circumscribed, that is, defined by the constitution of the part on which the influence is exerted, modified by the contingent condition of the individual to whom it is applied. This is a fact—not a hypo-

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thesis, and it is one of important consideration in every step of medical proceeding:—it is the base on which the medical art rests.

The physician, whose office implies the necessity of investigating the causes of things as they act on human health, does not permit himself to proceed beyond a visible point in what respects the application of remedies. He may be allowed to assume some latitude of view in speculating on the nature of causes, both in their formation and in their mode of progress through the different channels of the circulating system, prior to their evolution and explosion in the open febrile act. The material cause of the disease termed fever evidently proceeds from two sources, viz. exhalation from the surface of the earth applied directly to the subject, and emanation from diseased animal bodies applied directly, or by the intervention of substances that have been in contact with the source. The first cause is termed endemic. It rises and falls periodically as modified by season and circumstances in various visible ways. The disease produced by its impressions is thus calculable; but, on some occasions, an extra or adventitious quality is joined with it, which, in a manner, we do not comprehend, perplexes the proceeding and confounds the calculations. It constitutes a form of disease which obtains the name of epidemic.

The endemic cause is common to the whole surface of the earth, more abundant in some parts of it than in others. We are ignorant of its precise nature; but we presume, and not without reason,

that it is analogous to the cause which moves vegetation, at least its effects are most apparent where the materials of luxuriant vegetation most abound, that is, in rich and champaign countries, and in all places where water stagnates, or, where moving slowly in its course, it tends to decomposition. The cause of the endemic is widely diffusible in the air. Its force is increased by the impulse with which it strikes on the subject; hence it is impressive, as moved by currents of wind passing through ravines, hollow ways, and narrow defiles between mountains. It does not adhere to a third body, consequently the person on whom it acts must necessarily be in communication with the source—immediately or remotely.

The cause of the common contagious fever is generated artificially. It attaches itself to a third body, and it is conveyed by means of that body to distant places. It is capable of concentration and diffusion in various degrees; and, as diffused in a warm and dry atmosphere, it is dissipated and soon lost. The sphere to which its activity extends is a narrow one, rarely perceptible beyond the walls of the sick apartment, unless as communicated through a foreign medium. The specific contagions which occasionally excite fever, are of different kinds and of different degrees of diffusibility. They are specific and distinct; they are notwithstanding modified by epidemic influence or local conditions. Some spread to a comparatively wide circle; others make no impression except by actual contact.

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It would be satisfactory to the inquisitive, and not indifferent in point of utility to others, to be able to ascertain by what channels the material cause of fever enters the human body, by what course it proceeds through the various organs of the circulating system, and at what point of progress it emerges or explodes in the genuine febrile act. That the material cause of fever enters the system through the mouths of the absorbents, is a supposition of almost demonstrable certainty, and there is more than probability that it enters through the absorbents of the first passages, viz. mouth and stomach. If it make its entrance in this manner, its progress must be supposed to be made into the great circulation after the customary rule. It is reasonably supposed that it passes through the heart, as mixed with the common mass of blood without exciting commotion, and that the first step of the febrile process takes place when the noxious cause strikes upon a point of structure in the series of capillary vessels which constitutes an organ of function. The febrile act is not an instantaneous effect of the application of the febrile cause. It is perfectly well known that a space of time intervenes, such as seems to imply the existence of a precursory, or preparatory process. The space is different in different cases, and it is apparently influenced by constitutional habits and accidental contingencies. The common endemic rarely appears before the seventh day, more frequently not before the fourteenth, sometimes not before several weeks, or even months after exposure to the cause, or after remo-

val from the source where the cause exists. The complete and formal action of the contagious fever is, in like manner, seldom observed before the seventh, not generally until the fourteenth, and sometimes not until after the lapse of several weeks. Further, in cases of direct inoculation of specific contagious matter, the febrile irritation which constitutes the formal disease rarely occurs before the seventh day, sometimes not before the fourteenth. In many cases, the cause of fever remains dormant for months, and is only excited into action by contingencies which affect balances, or which augment susceptibilities in a manner to us unknown. It is evident, in case of inoculated contagions, that the inoculated matter passes by the customary channels of absorption into the mass of the blood, excites the febrile irritation and the consequent specific act at the organic capillaries only. We are warranted to conclude, from analogies, that the material cause of other fevers enters the system through the same series of vessels; and we may venture to say with confidence that it enters by the absorbents of the first passages, its local action being often conspicuous on the stomach and bowels prior to the development of general fever.—That the cause enters by the absorbents of the mouth and stomach is a fair supposition, inferred from what is generally observed among persons who are exposed to the influence of concentrated swamp exhalations, or the vitiated air of sick apartments. The atmosphere of swamp, in which the cause of fever abounds to excess, rarely

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fails to produce disagreeable sensations in the stomach, disagreeable taste in the mouth, accompanied with a desire to spit out something that is offensive. This sensation is so strong and unequivocal that some persons, myself among the number, can instantly tell, though blindfolded, when they enter the circle of noxious swamp air, or come within the sphere of an infected sick apartment. The sensations are always disagreeable, often such as arise from a nauseous unpleasant pepper acting on the fauces and stomach. The primary action is local, and the signs of it are often visible in the mucous membrane which lines the fauces. The sensation is felt strongly at the upper orifice of the stomach; and, in such case, the local action is removed, the further progress of the disease arrested by the operation of an emetic or strong purgative, which may be supposed to produce subversion, and thereby to eliminate the cause of disease from its first lodgement\*.

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\* That the material cause of fever, endemic or contagious, enters the system through the absorbents of the first passages has a show of great probability; and, in so far as respects jail or hospital fever, the proof is higher than probability. I draw the inference from what has occurred in my own person,—and sensation in this case is of some dependence. After the British troops were withdrawn from Holland in the latter end of the year 1799, the Russian auxiliary part of the force, to which I was attached, was sent to the islands of Jersey and Guernsey for winter cantonment. The gastric fever, which prevailed to considerable extent in the whole army at the time the troops



It can scarcely, I think, be doubted that the material cause of fever enters into the system in

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were withdrawn from Holland, was converted, among the Russians, by the time they arrived at Guernsey, into concentrated contagious fever, by the simple operation of accumulating a number of persons in transport ships during a tedious sea passage in cold and damp weather. The Russians were unaccustomed to service similar to that on which they had been employed in Holland; and, like animated machines driven from their routine, they were helpless in difficulty. I found them at Guernsey in the beginning of January, 1800, with a long list of sick; and, as I had occasion, in examining their various conditions, to approach near to the persons, I felt unpleasant impressions in the mouth and throat, descending to the stomach, accompanied with sensations in its passage as if I had swallowed an acrid disagreeable kind of pepper. The sensation continued the whole of the day; and, about ten at night, when in the act of undressing for bed, a singular kind of quivering was perceived at stomach, succeeded instantly by a sharp pain darting to the head, quick as lightning but of short duration. I lay down; a glow of heat, followed by more or less of perspiration, pervaded the whole frame; the night was passed in a kind of reverie between sleeping and waking, and, with such sensations of exhilaration, as if I had drunk largely of Champagne wine. The tongue in the morning was covered with a thick mucous coat; I had no appetite for food; there was no thirst, but cold water, in large draughts, was particularly grateful. The sensations at stomach were unpleasant, accompanied with nausea and occasional giddiness.—The strength was not impaired; I remained on my legs every day, during the continuance of this impression, from nine o'clock in the morning until four in the afternoon in visiting the different hospitals and barracks where the troops were quartered. There was aversion from solid food for two or three days; raw fruit and large draughts of cold water were acceptable; at night there was dreaming

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and reverie rather than sleep; the bowels were constipated with irksome sensations of desire; and nausea, with occasional giddiness, was so troublesome that it required all my resolution to resist the desire of taking an emetic. I was satisfied that the operation of an emetic would have removed the cause which occasioned the uneasiness; but, as I was desirous to ascertain the time, after the actual application of the cause of fever, (which was here distinctly known,) at which the disease formally explodes in action, I adhered to my resolution—I was disappointed in the result. At the end of the third day, constipation was removed from the bowels by liquid evacuation, and the indisposition, which as yet had only a local seat, disappeared in consequence.—This history, and it is but one of many thousands that might be adduced, seems to me to prove distinctly enough that the cause of the jail or hospital fever is received into the system through the absorbents of the first passages. The first action is manifested on the secreting surfaces of the mucous membrane of the alimentary canal, and the functions of that organ are variously disordered by it. Nausea, indigestion, flatulence, constipation, dreamings or wanderings at night like reverie, flushings of the face, glistening of the eye, lightness or giddiness of the head, are common occurrences, even exhilaration or vivacity of spirits, such as follows a glass or two of champagne wine, is sometimes observed. The cause of endemic fever seems to enter the system by the same channels as the cause of that which is contagious, and to produce similar disorder in the functions of the first passages, only sensations of languor, heaviness and oppression are more common than sensations of alacrity and animal vivacity. It sometimes however happens that, after a period of depression obviously resulting from the local action of a febrile cause, the sense of depression is suddenly removed, the spirits are light and buoyant, and continue so until a sudden and formal paroxysm of fever commences.

pursued by conjecture, and it is pursued almost without a ray of light. It is obscure in its nature; but, whatever its nature may be, there is reason to believe that its action is not felt until, in the course of circulation, it strike an organic point in a certain series of capillary vessels which constitutes a function. At this organic point, the action of health is subverted and the action of disease commences. The form of action, which constitutes disease, has a different movement and a different figure from that of health. Where it is progressive, it may be termed creative, as manufacturing, if the expression may be used, a new and peculiar product. The form of progressive diseased action, as excited by a foreign and noxious cause, tends to a premature termination—contingently to a fatal one. It completes its circle and ceases with the evolution of its new product. If the structure of organs that are important to the continuance of life be not destroyed by the violence of the action, the natural or constitutional susceptibility to impresssion, which had been blunted or suspended during the continuance of the morbid act, is re-produced in consequence of its cessation. The cause which stimulates the healthy action of the animal system, and which pervades the scene where the subject lives, acts on the restored susceptibility, re-produces the action thus forcibly suspended, and in a course of time restores its energy to its pristine state. The fatal tendency of the progressive diseased action produces effects, direct or contingent, which overwhelm or dis sever

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the vital organization immediately or remotely, consequently which occasion the local or general death of the system. This seems to be the manner in which recovery or death may be said to ensue from the progressive processes of febrile action; it is apparently different in the retrograde. In the retrograde form of febrile action, the first perceptible impression of the morbid cause seems to be manifested at the extremities of the venous system, producing congestion, sluggish motion or stagnation, instead of excited action. Recovery takes place through the accession of motion, however produced; death by total stagnation, or by processes of liquecence, which dissolve the organization of parts essential to the support of the vital process.

Nature of  
the Cause.

Much discussion has taken place among medical writers concerning the nature and qualities of the remote or material cause of fever; but the subject has not been elucidated. The remote cause of fever consists, according to the prevailing doctrine of the time, in a quality of matter termed sedative; the effect of which, as applied to organic life, is calculated to diminish energy of action—in common language to produce debility. The term sedative, as a medical term, is of ambiguous import: it implies, in strict interpretation, a certain measure subtracted from the customary force which stimulates and maintains the action of health; it does not imply subversion of the base of the action existing, followed by action of a new form, such as that of fever. If healthy action be subverted, and a new

action produced by the application of the material cause of fever, and it is almost a self-evident truth that it is so, we cannot say with propriety that the act is sedative, unless in so far as every power, which applied to the animal body, and arresting the existing action of the system, may be termed sedative by primary or direct effect, that is, by impulse of force subverting the existing movement. This is plain; but it does not bear on the present case, and it does not explain the question according to common opinion. The animal body, considered as a machine, is so constituted in its nature that the inherent principle of life, acted on by the impulse of a cause which is sedative according to common doctrine, is moved into action, and so moved, re-acts, and thereby checks, at a certain point of depression, the progress of the sedative or subversive act; unless where the force of impulse is so paramount to the power of resistance that the arrest is total, and immediate death the consequence. If this be admitted, it follows that the first impression of the febrile cause, though sedative as a force of impression, does not in reality produce an action of simply diminished force. The mode of action, consequent to the impulse, is of a new kind and character, the effect of a new and stronger impression than that, which, customary to the habit, maintains the ordinary action of life. This is the fact, and from this fact it may be inferred that the material cause of fever is not sedative of the healthy actions of the system; on the contrary, it is irritative of new and unnatural actions through-

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out the whole system, or in particular parts of it. This new or unnatural action constitutes the disease termed fever. From a view of the subject in all its latitude, the cause which produces the changed action, instead of being of a sedative, is distinctly of an irritative kind. It is presumed that it enters the body by the mouths of the absorbents—apparently the absorbents of the first passages, that it proceeds through the customary absorbent channels into the great circulation, that it finally produces the febrile act by irritating the extreme series of the organic capillaries, thereby occasioning subversion of the existing mode of action, and giving rise to actions of changed and unnatural forms, through which the different secretions and functions of the system are diminished, increased or changed in various ways and degrees. The febrile act is, to a certain extent, general in the whole system; but it is often manifested more prominently in some parts or organs than in others, a condition arising apparently from the different degrees of irritability in different structures, either existing constitutionally, or produced contingently by causes of accident. The head and stomach suffer more commonly and more remarkably from the action of a febrile cause than any of the other parts of the body, but the mode through which they suffer is varied almost infinitely. Besides the general febrile irritation, more or less regularly balanced in the different parts of the system according to what is now stated, the action of the cause appears sometimes to strike upon

one point, or one series of parts, where, it acts with force, and leaves the others in some manner exempt. This occurs in the ulcerative form, or sore leg; and sometimes in the dysenteric.—In such case, the general febrile irritation is scarcely perceptible. The local disease, though not apparently febrile, depends notwithstanding on the action of a general febrile cause—endemic or contagious, and is actually consequent, more or less perceptibly, to a general febrile act.

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## CHAPTER VI.

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### *Action and Power of Remedies.*

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**I**T follows in the direct order of things, after the detail of the action of the formal cause of fever that has now been given, together with the record of the effects that are produced by it on organic structure as manifested in dissection of the dead body, that I consider the action and power of remedies, that is, the means which have been employed, or which may be employed to subvert and change the tendency of perverted action at its commencement, or to remove the injuries already produced by it on organic structures, in so far as they are removable by means of art.

The limits of the present work, which is no more than a sketch, do not admit of more than a cursory view ; the present remarks must therefore be necessarily confined to the consideration of principal remedies only.



A. *Subtraction of Blood.*

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It is a fact, if any thing be regarded as fact in the uncertain science of physicians, that the disease, termed fever consists in actions that are subverted, or changed from the customary action of health in some shape or other. If this be admitted as preliminary, it follows by consequence that the first step of the physician, who undertakes the cure of such disease, consists in arresting the changed or perverted action; the second in soliciting, by suitable remedy, a form of action analogous with that of health. This is self-evident, and it is farther evident, in so far as we dare to reckon on the certainty of physiological evidence, that organic action is moved through the whole extent of the system by the impulse of the circulating blood. If that be granted, it follows by consequence that those measures, which abstract or withhold the application of the impulse, necessarily disturb the order, even perhaps actually arrest the action itself, whether it be healthy or diseased. This is a position which cannot be refused, and resting on this position, it is inferred that, as the impulse of the circulating blood stimulates organic action, and as the subduction of blood from the veins abstracts that stimulus, blood-letting presents itself as the remedy first in point of time, and most important in point of power for the cure of febrile disease of any which medical science has discovered. It is demonstrable that the act of subducting blood from

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the veins may be so managed as to arrest the existing action of the system of whatever kind it may be; it is thus preliminary of cure, if not absolutely and finally curative in itself. As such it is necessary to examine and ascertain the conditions to which it is to be applied, so that the success of the operation may be assured in all cases.—If the existing condition of the disease be that in which the subduction of blood constitutes the primary means of cure, the extent to which the evacuation may be carried with safety, the time at which it may be made with most advantage, and the mode after which it is to be made for the better assuring of the effect, are considerations of the first importance to be estimated and clearly apprehended previously to its application to any individual case.

Quantity.

1. The ancient physicians employed blood-letting as a remedy for the cure of fever on many occasions; and Galen, the most scientific among the ancients, employed it to great extent on most, viz. to the extent of six *kotylæ*, or until the patient became faint. Galen continued for many ages to be the chief authority among physicians; but in later times the authority was merely nominal. The spirit of his practice was lost, the just rule of application not understood; insomuch that the means, employed for the cure of fever, might be considered as nugatory in most parts of Europe at the time the brothers Botalli appeared at Asti in Italy. Leonardo Botalli, who is known by his writings, (but whose writings did not fall in my way until the year 1816,)

was a man of learning. He was modest but, at the same time, of a bold and decided mind. He revived, and perhaps improved Galen's practice for the cure of fevers in so far as relates to the management of bleeding, the remedy on which he placed his chief dependence. The quantity of blood abstracted by Botalli was high—deemed excessive, and generally reprobated as excessive by his contemporaries: the facts recorded in the following pages furnish ample proof that it was not dangerous. Botalli ordinarily took away two pounds of blood, or two pounds and a half at one time—sometimes three. The abstraction was repeated in a few hours—on some occasions to the extent of two more.—Sydenham followed Botalli at the interval of a century: he was a disciple, but not to the full extent.—Bleeding, as employed by Sydenham, cannot be regarded in any other view than as auxiliary. If it sometimes arrested the course of a mild disease, it could not be expected to do more than moderate the violence of a violent one, or remove congestion in a dubious and languid one. The army surgeon, whose practice Sydenham notices and credits on the authority of colonel Wyndham, was a true disciple of Botalli—if he did not go beyond him.—Dr. Dover, the buccaneer and inventor of the compound powder of ipecacuanha, was of the same class. I did not meet with Dover's book until within these four months: he and myself appear to have laboured in the same field; we appear also to have attained the same or similar views of practice in febrile diseases.

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The practice of Sydenham and of Boerhaave, which was what may be termed a minorative form of practice, prevailed in the West-Indies during the earlier part of the eighteenth century. Dr. Spence, a respectable practitioner, who resided at Lucea in the island of Jamaica, published a pamphlet in the year 1776, in which he recommended large and repeated bleeding for the cure of the fevers of the district where he lived. Dr. Spence went farther than his contemporaries; but he did not go the length of arresting the course of the disease suddenly and decisively by the practice he recommended. Dr. Mosely, who appears to have been in Jamaica at the time Dr. Spence's pamphlet was published, advocates the practice of blood-letting, in tropical fevers, enjoining expressly that blood be abstracted *ad deliquium* at the commencement of the *kausos* or yellow fever. I coincide with Dr. Mosely in recommending extensive bleeding in this form of disease: but I do not accede to the rule which he assumes for judging the measure. It is vague and uncertain. Deliquium occurs sometimes from the loss of a few ounces of blood, sometimes scarcely from the loss of six pounds. The act of fainting is not therefore a rule of dependence for regulating practice; for, where it occurs from the loss of a small quantity of blood, it proceeds, or may be supposed to proceed from secret sympathies in the constitution, unconnected with the subversion of the diseased action. No permanent change is made by it on the habit in such case; consequently the end in view, if

attained, is only to be obtained by contingency. Dr. Rush, and other American physicians carried subtraction of blood to great extent in the American epidemic, which went under the name of yellow fever; but the quantity subtracted was obtained by repeated subtractions—not by abstraction at one time. The general practice was depletory; the mode of depletion was not abrupt; such as arrests disease by force, and such as I have in view in the present history.

I shall now, having cursorily noticed the views of the more eminent medical writers on the subject of blood-letting as a remedy for the cure of fever, mention what may be thought to be more peculiar to myself. I was strongly prepossessed, from the time I could be supposed capable of forming opinion on a medical subject, with a presumption of the benefits to be derived from bleeding in most forms of febrile disease, but I possess no written record of my experience prior to the year 1774. I went to the island of Jamaica in the year 1774, and resided at Savanna-la-mar, in that island, until the year 1778. During my residence at that place I employed the lancet with freedom; but I rarely abstracted more blood at one time from any one person than twenty or twenty-four ounces. The quantity, which was abstracted at one time from persons who were under my inspection in St. Domingo between the years 1796 and 1798, was upon the whole high—generally from twenty to thirty ounces; in some cases, three pounds and upwards, particularly

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where I took upon myself the responsibility of the case. The quantity usually amounted to two pounds, sometimes three or more at the depot of military recruits and invalids during the year 1801, while I superintended the medical duty of that establishment and executed the office of physician. In the West-Indies, in the island of Barbados, and more expressly in the hospital of the Royal Artillery, the quantity of blood, abstracted at one time during the years 1813 and 1814, was rarely less than three pounds, frequently four or five, sometimes six; the vein was even sometimes re-opened at a short interval, the blood allowed to flow to the extent of four pounds additional, amounting in all to ten pounds in twenty-four hours. It is almost unnecessary to say that it was only in the most concentrated forms of disease, particularly in forms which indicate congestion or adhesive inflammation in the substance of the brain itself, that these excessive evacuations were necessary or proper. They may appear to the reader, who has no knowledge from experience of the forms of disease to which they were applied, to be unsafe; but I am warranted to say, from a retrospect of the whole proceeding, that no accident occurred in any instance from the most excessive bleedings that were made in the Artillery hospital; and I may add, that strength was so little impaired by this apparently revolting practice, that the greater number of persons who were treated in this manner returned to their duty, within a fortnight, in the full vigour of

health. The depletory practice alluded to was similar in other corps, and other islands in the Windward and Leeward island station during the period alluded to; but rarely to the same extent as at Barbados in the hospital of the Royal Artillery, which was under the immediate care of Mr. Thomas, a most praise-worthy officer—discerning and zealous in no ordinary degree.—To what has been now said on the subject of blood-letting among the soldiers of the army, the concerns of whose health were placed under my immediate superintendence, I take the opportunity of adding a remark on what I know only more remotely, viz. the practice pursued in the Royal Navy. The surgeons in the Navy, who served on the Windward and Leeward island station in the interval between 1812 and 1814, employed blood-letting with great freedom in most forms of fever, both on board of ship and in the hospitals on shore, but not I believe generally to the extent here stated. The quantity abstracted by them, rarely, as I am informed, exceeded two pounds at one time; the abstraction, as I understood, was repeated at the interval of a few hours, if the force of the disease had not been broken by the effect of the first operation.\*

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\* The quantity of blood, here recommended to be abstracted from febrile subjects in certain conditions of disease, may appear to some to be enormously great so as to threaten danger to life. I do not contend that the disease was cured by it; the returns shew that life was not destroyed by it, or the powers

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Time.

2. If the arrest of the diseased course, implying the abrupt cure of fever, be the main object in the view of the physician, it is evident that the sooner the remedy, viz. subtraction of blood be made, the more certain and the more perfect will be the effect. If it be made within six hours from the invasion of continued fever, or before the paroxysm of the periodic fever of violent excitement has attained its acme; and if it be conducted with all the discretion and energy that are necessary to give effect to the purpose, the diseased course is generally arrested, the susceptibility to the stimulation of causes which maintain health in its ordinary train restored; consequently the disease is cured, or prepared to be easily cured. The reason of the thing is comprehensible, and the rule of proceeding easy in forms of excited action. It is difficult and embarrassed in others; for example, where vascular action is languid—oppressed by congestion or other impediment, there is interdiction on the superficial view; there is conviction on the more correct view that blood cannot be too soon abstracted. It is plausible in theory, and true in experience that the movements, which are produced in circulation by the eduction of blood, constitute the direct means of removing the impediment. The success of the measure is comparatively sure as the congestion is recently formed:

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of the constitution broken by quantities the most enormous;—the army never had so few invalids as where this practice prevailed.



it is less certain in proportion to duration ; but it is not dangerous, or insignificant at any period that the condition alluded to is discovered to exist. Blood-letting, according to my own view of the case, is often employed preliminarily with a view to assure the effective action of other means that are necessary for the final cure of the disease ; other means, particularly warmth, warm bathing, warm steams, or warm fomentations, even wine and internal cordials are sometimes necessary preliminarily, to prepare and assure the salutary effect of bleeding, more especially at the more advanced stages of fever. The simple act of abstracting blood from the circulating system is often decisively effectual in arresting the course of fever, where it is resorted to at an early period, and where the process is properly conducted. It has still salutary, but less decisive effects, where the course is more advanced, that is, beyond the third day ; it is not of dependence, but it is not prohibited, and it is occasionally useful even at late periods. It is not then safe to carry it to the extent of effecting precipitate arrest ; it is safe, as well managed, to obviate impending dangers, and often to facilitate the developments of regular crisis. Abstraction of blood is moreover safe, and its effect is often important at the first moments of relapse. If employed in time, it obviates or removes congestion, and thereby prevents effusion into internal cavities, or into the substance of internal organs, in which the tonicity or power of resistance has been diminished by the preceding course of the disease.

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But though the abstraction of blood may be beneficial in the case stated, it is only so conditionally and under management. If the effect, produced by it, be not seconded by well considered means of stimulation, general or local, the chances are that the harm will be greater than the good. But while blood-letting is a remedy of nice management in cases of relapse, it is to be avoided, as well as other remedies of strong operation, where there exist appearances of approaching favourable crisis; on the contrary, where the critical power labours, and the critical effect is marred through internal impediment, the abstraction of a given quantity of blood is often followed by signal benefit; it gives facility to the course of the salutary process artificially obstructed.

Mode.

3. Besides quantity and time, the mode according to which the abstraction of blood is made from the system, is important to the success of the effect. The general principle on which depletion acts being kept in view, the mode, according to which it is conducted with a view to produce the precise effect, must necessarily be supposed to vary according to the condition of the subject to which it is applied.—I consider it, in this place, as applied to the more aggravated forms only, on whatever temperament the morbid action may be manifested.

Sanguine  
Tempera-  
ment.

And first, if the fever be manifested on the sanguine base of temperament, the action of the heart and arteries violent, the patient is to be laid in a recumbent posture, the head somewhat elevated, a large vein, or two large veins selected, and a large open-

ing made in the vein, so that the subduction be sudden as it can possibly be made. Instead of measuring quantity by ounces in the prescription book, or trusting the measure to the discretion of the subordinate operator, the physician, who is interested in the fate of his patient, will take care to be present, so that he may have the opportunity of judging the measure by the effect. It is necessary, in the case under view, that the stream be allowed to flow until some change be produced in the existing circumstances, viz. until the stricture of the skin relax, until pains and distresses diminish or cease; in short, until the perverted action in all parts of the body be brought to arrest; or, until freed from oppression, it move with ease and freedom. Faintness, vomiting and evacuation by stool often supervene under the act of subducting blood in the manner here recommended. Where the faintness amounts to actual fainting, the evacuations by vomit and stool to free vomiting and purging, the morbid action is arrested and the disease may be considered as cured, or rendered susceptible of easy cure. If fainting supervene, without the presence of satisfactory signs of an arrest of the morbid course, the arm is to be bound up, and the patient is to be treated by means that solicit recovery. When the recovery is assured, the existing condition is to be minutely examined, and if symptoms of uneasiness remain, viz. impediment to respiration, pain in the head, either as it reclines on the pillow, or as it is moved suddenly and vio-

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lently, constriction of the surface, contraction and hardness of the pulse, the effect of the blood-letting cannot be considered as complete; consequently the vein is to be re-opened, the blood allowed to flow, under the immediate inspection of the physician, until the purpose in view be fully attained; that is, until evidence of the arrest of the disease be completely established. If the case be complicated, that is, accompanied with prominent local action, more especially with rending pain and sense of oppression in the head, the temporal artery is to be opened in preference to a vein in the arm. The effect is more direct; and, as there is no danger, there is little difficulty in performing the operation. In cases where torpor is a prominent symptom, such as indicates venous congestion, or adhesive inflammation in the interior membranes and substance of the brain itself, the jugular vein presents the more direct channel through which the subduction should be made. The mode promises benefit; but the trouble and supposed difficulty, connected with the correct performance of the operation, stood in the way of its being often resorted to in the military hospitals which I have myself superintended.

Lymphous  
Tempera-  
ment.

B. In fevers, which occur in the lymphous temperament and which are of the higher degree of intensity, characterized by symptoms of congestion, or adhesive inflammation, general or local, the quantity of blood which may be abstracted from the mass, without inducing fainting, or arresting

the diseased course, is often enormously great; and, great as it may be, the end in view is not safely and perfectly attained without the aid of other means besides that of simple subtraction. In such case, instead of attempting to arrest the course by one process, it is proper and here recommended, after two pounds of blood, more or less according to circumstances, have been abstracted from the vein, that the arm be bound up, the patient immersed for twenty minutes or half an hour in a warm bath of high temperature, the whole body, particularly the extremities rubbed with soap and scrubbed with brushes, the scrubbing continued, not only until all incrustrated dirt be removed from the skin, but until the skin become animated and acutely sensible. When there is evidence of this being effected, the bandage is to be removed, and the blood allowed to flow until a change of condition be effected. The change of condition is indicated by faintness, sickness, vomiting, evacuation by stool; or by energy, freedom and expansion in the pulsations of the arterial system, accompanied with sensations of freedom and ease in all the functions. It is impossible to say *a priori* what quantity may be necessary to produce the effect in any given case, but if things be managed in the manner here recommended, two pounds additional will ordinarily suffice.—When the contemplated arrest has been attained through proper application of the means stated, the case is laid open to the action of remedies which excite and forcibly maintain the action of health in its customary course.

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VI.Gangre-  
nous Tem-  
perament.

C. In fevers which occur in the gangrenous temperament and which are of the major degree of force, whether connected with general or local torpor and stagnation, abstraction of blood is rarely effective of purpose, and often not safe in practice, unless it be combined with other means of conservative or auxiliary power adapted to the circumstances of the case. Among these may be reckoned a pure and refreshing atmosphere applied to the body in frequent successions, immersion in a warm bath, rubbing with soap and scrubbing with brushes. As soon as the circulation is animated by the application of the means alluded to, the vein is to be opened, the blood allowed to flow, under careful circumspection, until evidence arise that congestion is resolved and a change of condition assured. The head, lungs, liver and spleen are the organs principally subject to congestion or stagnation of blood. The sign that such congestion is resolved by the treatment adopted, presents itself in the freedom with which the several organic functions are performed, viz. energy, freedom, and expansion of pulse, diffusion of the current of life and activity to the surface and extremities of the body. The quantity, necessary to produce the effect, cannot be measured *a priori*. It is often considerable, rarely less than two pounds, sometimes not less than four. It is generally proper, in the case under view, to draw off the blood while the patient is in a recumbent posture; and it is often necessary to stop the stream at intervals, to move

the body alternately by stimulation, or to suffer it to remain at rest under immersion, with a view to effect the purpose by alternate motion and rest, or to ascertain the progress that has been made in effecting it.

D. In fevers, the principal action of which is manifested on the system of serous secretion, whether by constriction and suspension, or by convulsively irregular action and other mode of derangement, the subtraction of blood is often a remedy of value ; but it is only of value according to the manner in which it is managed. It is here that immersion in warm water, fomentations with flannels wrung out of hot water, rubbing the body with soap and scrubbing it with brushes, frictions with warm and stimulating oils, &c. conduce materially to assure the beneficial effect. By means of these assistances, changes are often induced on febrile action by the subduction of two pounds of blood, which would otherwise have scarcely been induced by four, or which could not have been assured by any quantity that cautious men would venture to take away. Where the disease is advanced in its course, and where there are indications of weakness, whether from oppression of important organs or other cause, it is proper, if bleeding be approved as the remedy, that great caution be employed in the manner of managing it. It is advisable, for example, that the vein be compressed at intervals during the operation, with a view to ascertain the condition of things and to estimate the probability of attaining the ob-

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ject by a farther proceeding ; for, as there are many cases where we may act fearlessly in subtracting blood, so there are others where we must proceed step by step, and with cautious circumspection of all the conditions that bear upon the subject.

General  
Remark.

The above are a few of the circumstances that ought to be attended to in subtracting blood from the febrile subject as relative to quantity, time and mode. It is proved in experience, and the reason of it is comprehensible to those who observe the laws of animal economy, that the subtraction of a large quantity of blood from the circulating mass frequently arrests the course of a febrile disease, and thereby lays the case open to the action of other powers which restore health abruptly and often completely. The case has been proved times without number in my own experience ; and I can add with a safe conscience that, though the quantity of blood taken away under my direction was often enormous in the common estimate, the result was in no instance destructive of life,—in most, it was decidedly curative of disease. I have had cause to regret the timidity ; I have no cause to reproach myself with the boldness of my practice, as applied under my own eye to the cure of fevers. But, though I say this in truth, I do not say that bleeding in large, even in any quantity, is uniformly proper or uniformly safe. I am warranted to say from the experience of a long life that, prescribed with consideration and applied with management in execution, it is both a safe and powerful re-



medy, either decisive of cure by its own power, or preparatory of the curative power of others.—If there be no prohibitory circumstance in the case, one bleeding is preferable to repeated small bleedings. Small bleedings diminish violence, and avert the destruction of organic structures; they do not prevent the diseased action from proceeding, through the regular process of what is termed coction, to a constituted period of formal crisis; but, as prevention is the professed and proper object of the military physician, the decisive means, if they be at the same time the safe means, are those which ought to be adopted; they are those which are here recommended.

E. What is said above relates to abstraction of blood in large quantity as a decisive remedy for the abrupt cure of fever. I now notice cursorily the effect of small bleedings, repeated at short intervals, in an auxiliary view only. These, as experience shows, are often of importance in conducting the disease to a safe issue; sometimes indeed, the small bleeding is the only mode of bleeding that is admissible. The abstraction of blood seems, by diminishing quantity in the circulating canals, to act on the condition of the blood itself. This is almost submitted to the inspection of the eye, in the numerous experiments, that are made contingently in the treatment of diseases, through the medium of this remedy. If the condition of the blood be changed by the abstraction of quantity, the organic act, which follows as a consequence of the impulse of the blood and which

Modified  
Abstrac-  
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corresponds with its nature, is also necessarily changed; hence one important step is gained, but not a final one. Where the energies of life are oppressed, as influenced by a morbid condition of the blood and humours, whether the occurrence take place in eruptive, petechial, gangrenous or putrid fevers, accompanied, or unaccompanied with abscesses and ulcerations, the subtraction of blood in small quantity, repeated at short intervals, especially as combined, or succeeded by a series of stimulations, frictions, wine, internal cordials, change of place, and gestation in open air in suitable carriages, conduces materially to solicit the power of life, or to render it susceptible of such solicitation, as conducts it to its customary channels and maintains its efficiency in its recovered course. But though I regard the abstraction of blood as a remedy of the first importance for the abrupt and successful cure of fever, either primarily or secondarily, I am yet free to own that its good effect principally depends on the manner of adjusting the subtraction to the condition. It often fails, and even sometimes does harm where, employed as principal, its real place is only that of auxiliary; and, *per contra*, where employed as auxiliary, its real place is that of principal. It is thus that in fevers, which occur in the lymphous and gangrenous temperaments, the subtraction of blood, not accompanied with, or followed by the application of powers that stimulate to a new train of action analogous to the action of health, is often injurious, and even sometimes justly accused of accelerating

death. It is a self-evident truth that the subtraction of blood has a tendency to render the system susceptible of stimulation; and it is open to observation that where constitutional irritability is high, the effect of subtraction is of itself sufficient to assure the reproduction of healthy action; where it is low and dormant, as in the gangrenous and lymphous habit, the healthy or progressive act, though the restrictive cause be removed, may not, or does not in fact appear without the stimulation of stronger power than that which excites and maintains the ordinary action of health. This is obvious; and it is reasonable to conclude from it that, if the progressive act be not moved by the effect of the abstraction, the retrograde will scarcely fail to be accelerated. The reason is plain and clear enough to common apprehension. If the fact be known, and the reason on which it depends be understood, there can be no great difficulty in accounting for the unfortunate events that are stated to occur in consequence of blood-letting; and what is of more importance of discovering the means whereby their occurrence may be prevented.

### B. *Heat.*

The application of heat to the surface of the body, whether by immersion in hot water, hot steams, high atmospheric temperature, direct impression of heated bodies, viz. hot flannels, hot bricks, half burnt billets of the heavier woods, bags

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filled with hot sand, bottles filled with hot water, or the contact of hot blooded animals, presents itself as an auxiliary of such importance in various conditions of febrile disease as necessarily solicits notice in this place. The influence of heat stimulates the action of animal bodies to greater activity, whether applied generally or locally. A certain degree of it is essential to the continuance of life; and, on the proper proportion and just distribution of it throughout the habit, general vigour and energy of animal action in a great measure depend. The application of heat to the surface, in moist or dry form, is often preparatory of bleeding, or other remedies employed for the cure of fever; it even sometimes cures the disease by its own power. Sensations of cold are often vehement at the commencement of fevers, particularly at the commencement of fevers of the periodic class. They ordinarily alternate with flushings of heat: they, for the most part, abate, and even vanish after a certain duration as a condition of the febrile process. The sense of cold, instead of being intermixed with flushings of heat, is sometimes deep and obscure, continued and uniform, the skin torpid in a temperature of ninety, scarcely warmed, or supported in warmth by a bath exceeding a hundred degrees of Fahrenheit's thermometer. This sense of dead cold presents itself in certain forms of epidemic fever of the lymphous character. It is peculiar, and seems to indicate that the force of the morbid cause acts on the substance of the brain by repressive effect. In such case, the

impression of heat by immersion in warm steam, by the application of heated bodies, by frictions with heated flannels, stimulating oils and other similar means which infuse warmth and solicit the tide of circulation to the surface, is directly indicated as remedy. Heat is here preliminary to all other applications; and, as it is obvious to common apprehension that while it excites animal action generally, and entices the circulation of blood to the surface and extremities of the body, it is calculated, by its influence on organism, to diminish internal congestion mechanically, in so far as congestion is induced or augmented by exterior constriction; and farther that, while it acts on the circulating system in the manner stated, it acts powerfully and agreeably on the sentient, exciting or restoring lost sensibility, and thereby laying the case open to be acted on by means which, without this preparation, would have no effect. The fact is founded; the inference direct: and I may add in illustration of it that, if an attempt be made to abstract blood from the veins, under the form and degree of coldness and torpor alluded to, the blood either does not flow at all, or, if it do in reality flow, the effect on the issue of the disease is precarious—not improbably fatal; on the contrary, if the circulation be previously animated by the infusion of external heat, either in moist or dry form, blood may be subtracted with safety and with effect, either as arresting the course of the fever by its own power, or as restoring the condition of general susceptibility through which it is prepared to be arrested by others.

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Warm Bath.

The ancients employed warm fomentations, immersions in warm water, affusions of warm water; frictions with warm oil, &c. to great extent, and apparently with great effect for the cure of various forms of fever. Galen, the most scientific and skilful among the ancients, conducted them in a manner to give impression to the act, and, at the same time, with a luxury and elegance of application that could scarcely fail to make them acceptable to the sensations of the most fastidious. Warm bathing, and warm fomentations are occasionally employed by British practitioners at different stages of fever; but, in so far as I have been able to judge from accidental observation of the management, not in a manner to assure all the benefit that warm bathing and warm fomentations properly managed are capable of producing. The practice of the ancients is adopted, the principle is not fully comprehended. The remedy is important in itself; and it is necessary, in order to obtain from it all the good which it is capable of doing, to administer it with the requisite accompaniments, viz. it is essential that the air of the bathing-room be pure and of a refreshing temperature, cool in summer and in hot climates, warm in winter and in cold weather; that the patient be undressed and laid, with all the care and tenderness that his condition may require, in a convenient bathing vessel, the water sufficient to cover every part of the body, the temperature agreeable to the feeling rather than judged and measured theoretically by the scale of a thermometer. The water employed

is ordinarily pure fountain or well water. There are particular cases where sea water may be used with advantage; and others where the addition of *eau de Cologne* or *Aqua Ammoniæ* may heighten its efficacy. If it be desired to make a change in the conditions of the diseased state, and not simply to purify the person of the patient, three-quarters of an hour, or even an entire hour will not be more than sufficient to afford the chances of its being properly effected.—The act of rubbing the body with soap while immersed in the bath, of scrubbing with brushes in every the most torpid part—hidden or exposed, aid materially in restoring animation to the surface. The restoration of animation is an object of primary importance. When it is attained to a certain extent, the abstraction of blood, if there be indication of internal congestion, or sluggish general circulation, presents itself as an important and direct remedy. If the remedy be approved, the following is recommended as the manner of conducting it, viz. let a vein be opened in the arm, the blood allowed to flow in a moderate stream, in quantity suitable to the circumstance of the case, let the scrubbing with brushes, &c. be continued while it flows, the hands, breast, head and face occasionally sprinkled with cold water, and wine, or other cordial given discretionally during the continuance of the prescribed discipline. The patient, treated in this manner, often observes that he has ease and even of pleasure in his sensations; that he is conscious of life and of the action of life at every pore.

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Sensations of pleasure, produced in this manner, often overcome or diminish the sufferings of pain, weaken the force of the disease comparatively; and, so weakening it, bring it under the power of remedies, which, without such auxiliary means, would fail to make impression on it.

C. *Cold.*—*Affusion of cold water.*—*Cold drink.*

The sudden application of cold to the febrile subject, whether by the affusion of cold water on the surface, or by the administering of cold drink internally, is another of the remedial powers employed by physicians, sometimes for the abrupt cure of fever, sometimes with no higher view than to mitigate the violence of symptoms, and thereby to diminish dangers. The practice, which was common and one of principal dependence with the ancients, was abandoned, as not understood, by their successors; insomuch that, when re-introduced in England, at the close of the last century, it was considered by many as in some degree a new discovery. The limits prescribed to this work do not permit me to trace in detail the history of the remedy, and it is not very important that I should. It is not in fact of much consequence to know by whom it was introduced, by whom it was approved, or by whom rejected; it is of consequence to investigate and ascertain the principle on which it acts, and to adjust the manner of applying it so as to obtain from it the precise and just effect. The ancients, and all of



the moderns who have had recourse to this remedy appear, with the exception of Dehahn, to have had recourse to it only under the existence of an excess of febrile heat. Whether such persons believed that the essence and being of fever consisted in excess of heat, or that heat is only accessorially connected with it, they seem to have considered its subtraction, by the application of the cold, as the direct cause on which the success of the remedy depended. The case of Dehahn shakes the basis of the doctrine; and, if it were necessary, I might add that there are multitudes of instances in my own experience which lead to the same inference as that of Dehahn.

Hippocrates, Galen, and the late Dr. Currie of Liverpool, who is generally regarded as the person who introduced the practice of cold affusion into England, at least who gave it currency among the medical practitioners of this country, rest their faith of success on the previous existence and subsequent subtraction of preternatural heat. The object is precise, the reasoning is specious, and the testimonies of good effect are numerous in English hospitals, both civil and military. The practice, as directed by this view, was adopted in the British military hospitals in the West-Indies soon after the publication of Dr. Currie's reports on the effects of water, and the benefits thence derived were often proclaimed by official reports from that country to be decisive. General reports are often vague—not of dependence as basis of critical fact; in proof of which, I may add that case histories of fever with

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remark on the effect of remedies, have been taken down by medical officers, officiating in the military hospitals of the Windward and Leeward island station, since the year 1805. The cases are not in general minutely detailed; but, such as they are, they constitute a record; and, by referring to such of them as are still preserved in the office of the Inspector of hospitals at Barbados, it appears that affusion of cold water on the surface stands at one time in the prescription books as a remedy of principal dependence, at another, it is not noticed. Where prescribed, it was prescribed only where the temperature of the body was preternaturally increased; and, so prescribed, the reports state that, on some occasions, heat was moderated, refreshment sensible, relief temporary—sometimes permanent—sometimes not observable. This was ordinarily noted in the detailed history. It seemed, upon the whole, to imply a favourable inference respecting the power of the remedy: it became difficult, on closer examination, to estimate the degree; for the columns of mortality, in the returns, did not show any material diminution in the aggregate number of deaths where affusion was the remedy of trust, and where it was not at all, or only very partially employed. This fact is official, drawn from a review of hospital returns; and, trusting to its accuracy, a suggestion necessarily arises that the favourable reports, then usually made of the benefits of affusion, are not founded, or, that the circumstance under which the affusion was made, viz. the presence of increased

heat, is not the condition by which the application of the remedy is to be directed.

The fact, now stated, leaves room for more than doubt that the principle, assumed by the author of the medical reports on the effects of water, is not the true one. In the case of Dehahn, the surface of the body was of an icy coldness; the effect of sponging with cold water was notwithstanding grateful and cordial; and, in the opinion of Dehahn himself, the means which actually saved his life. In the first period of my own experience, the temperature of the body did not, I must confess, present itself as an essential condition for authorizing the application of this remedy. It was sometimes high, sometimes low, even lower than the standard of health by some degrees; the effect was nevertheless salutary, independently of these varying conditions. The first experiment, which I ventured to make on this subject, was on the body of a negro boy who appeared to be in the act of dying—the temperature, in so far as I recollect, not higher than natural. The boy, though past all hopes of recovery, was revived, and apparently prevented from dying for some hours by repeated aspersions of cold water. The second was an European sailor on board of ship, recently attacked with fever. He was a vigorous and robust man; the temperature was high and the arterial action violent. Blood was abstracted from the arm to a considerable amount, and several buckets of water, drawn immediately from the sea, were poured upon the head and shoulders after the

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the Author.

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abstraction. The third was in like manner an European sailor—the disease at an advanced period; the temperature was below natural, and mobility was so excessive as to threaten fainting when the head was raised from the pillow. In this case, the head and face were sprinkled with cold salt water; the patient was refreshed, and encouraged by this success, I ventured to direct that an entire bucketfull should be poured upon the head and shoulders. The effect was salutary; the heat rose to a higher scale; vigour was restored, and signs of recovery were visible from this date. The instances in my own experience, and even in the experience of others, are so numerous and so pointed as to the inconsequence of temperature, that I should not have thought it necessary to dwell upon the subject, had not the precept of the author of the medical reports such possession of the public mind, at the present time, as to deter almost every one from employing the remedy where the prescribed condition does not exist in an open and marked degree. I am not prone to controvert opinion for the sake of controversy; but I cannot help saying that the precept of Dr. Currie limits the remedy to a narrow sphere; even interdicts it, where the experience of others has sanctioned its safety and proved its good effect\*. This is a fact, and I cannot in justice to

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\* An instance is stated in the London physical and medical journal for 1818, where cold affusion was applied to a case of what is called Typhus fever, in which were the principle, assu-

truth, do otherwise than assert it. It is in my power to give numerous illustrations of it; but I abstain from filling my pages with things that are self-evident to those who consider and reflect; and, to those who neither consider nor reflect, fact and argument do not avail.

I think I may venture to say, without hazarding a chance of contradiction from persons of correct observation, that the salutary action of cold affusion, in febrile diseases, is not necessarily and indispensably connected with the presence of increased heat. The affusion, though made in the most correct manner, is sometimes void of effect where the temperature is above the natural standard; sometimes the temperature is reduced by the affusion, the fever notwithstanding continues, and the dangers of the disease increase—apparently in consequence of the action of the remedy. But as the application of cold water to the surface is not, as now observed, always salutary where the temperature is high, so it is not always injurious where heat is below the standard of health. It is even then salutary, raising temperature to a just standard, animating circulation and giving in many instances force and energy to the renewed action of health. If this fact be ad-

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med by the author of the medical reports, well founded, life must have been extinguished by the effect. The benefit was notwithstanding striking; health was speedily restored, where death would have been almost said to have already obtained possession of the subject.

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mitted, and it stands on testimony that cannot be shaken, some other principle besides the evidence of increased heat of surface must be sought for to direct the application of the remedy; and some other means of explaining the effect of the operation must be resorted to beyond the simple change which is induced upon temperature. The enquiry is an important one; for, unless the rule of applying the remedy be shewn to rest on a principle which has a general base in the mechanism of the frame, the application will be a random application, the effect uncertain, the consequence dangerous—sometimes fatal.

It is within every man's comprehension, and it has, we may presume, been proved by most men's experience, that the sudden application of cold water to the surface of the naked body, strongly and forcibly impresses the existing organic action of the whole system, even impresses it so strongly as to arrest it for a time, whether natural or diseased. If the action be arrested by the impression of a forcible cause, and if the structure of the organ in which the action moves be not injured, or destroyed by the force of the impression effecting such arrest, the inherent energy of life endeavours to re-act at the point of cessation, and, in such case, the re-action recurring to its customary channel, health is restored, and in the course of time re-established. If this be admitted, and it is a fact of obvious and frequent occurrence, the affusion of cold water on the surface of the febrile subject, presents itself as

the means of directly arresting the diseased course by its own power, and of thus laying the case open to the action of causes which are calculated to renew and to maintain that which is healthy or natural through direct impression upon organism—not through subtraction of heat. This is the fact, and it is important to add in illustration, that the change produced upon temperature, instead of preceding, follows the change produced in the condition of the action, viz. lowered where preternaturally high, raised where preternaturally and morbidly low. This fact is often demonstrated in experience;—and it is a fact which limits our knowledge on the subject.

As the effect of the sudden application of cold water to the surface, like other causes of impression, cannot be expected to be efficient and permanent of purpose, unless the whole organic series be of equal or nearly of equal susceptibility in every part of the system, the first step in the physician's course is necessarily directed to ascertain the existence or non-existence of that general condition. If it be present in the requisite degree in any given case, the remedy may be applied with prospect of benefit at any period of the course; though, with prospect of decisive and permanent benefit only, in proportion to the simplicity of the form, or the instability of the act constituting the new action, or diseased phenomenon. If the condition do not exist in the case as it presents itself, the preparation of it is indispensable prior to further proceeding. The preparation alluded to is effected by a combination of means, some-

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times apparently opposite in their nature to each other: and, as such preparation is important to success, I shall carefully endeavour to unveil the principle on which it depends, detailing briefly, and as clearly as I can, the process through which it is to be attained.

1. In recent cases of fever of the simpler form, more especially in such as arise in crowded barracks, crowded transport ships or other crowded and ill ventilated places, characterized, for the most part, by a hot and glowing skin, pains acute and changeable in their forms, pulse frequent—quick and buoyant, absence of internal congestions, &c., the condition of susceptibility, so imperiously required to assure the effect of affusion, is ordinarily present in the requisite degree;—consequently the remedy is ordinarily a remedy of safety and efficacy without preparation, at least without preparation of a complicated kind. 2. In another case, viz. fever of concentrated force, preparation is indispensable in every stage of progress; but, the means of accomplishing it are often complicated, even opposite in their nature to each other. If arterial action be strong and vehement, and, more especially, if it be oppressed and as it were confined by local impediment, the pulsations hard, contracted, deep and inexpandible, the skin hot and ardent, particularly at the præcordia, or, thick, compacted and torpid, the abstraction of blood, whatever be the degree of heat marked on the scale of the thermometer, is indispensable as a precursor of cold affusion. The



quantity to be taken away, in the case described, can only be determined by the change which arises under the act of abstraction, viz. ease, freedom and expansion in arterial movement, relaxation of the surface and signs of susceptibility to ordinary powers of impression. Immersion of the body in warm water, purification and friction of the skin with soap and brushes, aid materially in effecting the purpose of preparation in view; but they are feeble and imperfect as unaccompanied by abstraction of blood. 3. In other forms of fever, where signs of internal congestion are prominent, and where they are accompanied with a cold and torpid state of the skin, a deep seated, sluggish and oppressed pulse, immersion in a bath of high temperature, and frictions with soap and brushes take precedence of, but do not supersede the necessity of abstracting blood, which, in all such cases, must necessarily precede the cold affusion. 4. If the febrile action be accompanied with tremors, startings, disposition to faint, inability to rise up from muscular weakness, delirium without marks of congestion in the brain, a pulse frequent, soft and weak, a state of skin soft and inelastic, general mobility or increased sensibility to all forms of impression, the preparation, as suitable for the affusion of cold water to the surface, instead of being made by abstraction of blood, is to be made through warm or tepid baths regulated by the feeling of what is agreeable, frictions with stimulating oils, exposure to cool and refreshing air; and, if it can be accomplished, ges-

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tation in the open air in spring or other carriages, together with wine or other internal cordial that the patient may desire. When the state of things has been changed by the processes now stated, or others similar, so that the habit is not only easily susceptible of impression, but effective of re-action when impressed, the affusion, or aspersion of the surface with cold water, more particularly with cold salt water, may be made with confidence of benefit, at least without dread of injury. Abstraction of blood may sometimes be proper as auxiliary; but, it must be employed with caution, and it cannot be carried to any extent with safety in the last mentioned condition.

As the conditions of the disease vary materially in different subjects, the mode of preparation requires to be varied in correspondence with that varying condition. The means now stated, viz. abstraction of blood, fomentations and warm baths of varied temperature, frictions of the skin with soap and brushes, gestation in the open air, wine or other cordial, are sufficient, if correctly measured and properly applied, to prepare a condition under which the affusion of cold water may be made with safety upon the febrile subject—and with a fair prospect of benefit. The proper employment of the remedy depends on the judgment of the prescriber; and, as the well adjusted application is important to the accomplishment of the purpose, the prescriber, whether physician or surgeon, if actually interested in the fate of the patient, or desirous to ascertain the

real power of the remedy, will consider it to be his duty to superintend and witness with his own eye every step of the proceeding.

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Application.

To the outline of the rule now given for directing the preparation of the febrile subject previously to the affusion of the cold water on the surface, I sub-join, in as few words as possible, a detail of the different steps that are necessary to be observed in making the actual application. The febrile patient, who is the subject of the experiment, prepared in the manner that has been explained, is to be placed in a bathing tub half filled with warm water of such temperature as may be most suitable to his circumstances, the skin to be thoroughly cleaned by means of soap and brushes, even to be scrubbed by the brushes, so as to be rendered easily susceptible of impression. When this point is attained, the body is to be raised up and placed on a stool within the bath, the cold water dashed about the head and shoulders—thrown suddenly and impulsively from a bucket, or allowed to descend gently and in small quantity through a sponge according to the circumstances of the case, or the temperature of the water employed. In vigorous subjects, in recent disease, and in tropical climates or other hot countries, the affusion by means of the bucket will rarely be too much; in exhausted and delicate subjects, in advanced stages of fever and in cold climates, aspersion; or affusion through the sponge will for the most part be sufficiently impressive; and, as less formidable to the apprehensions of the timid, it is

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to be preferred When the operation is finished, the subject of it is to be wiped dry, dressed in hospital clothing and laid in bed. It is not necessary to be scrupulously nice in drying the skin where there had existed an excess of superficial heat previously to the affusion, particularly in vigorous habits and at early periods of fever; on the contrary, it is especially important in delicate subjects at advanced periods of disease, not only to dry the skin carefully, but, after it has been dried with linen towels, it is expedient to rub it long and carefully in all parts with flannels heated at the fire, even occasionally to rub it with warm and stimulating oils as well as flannel. If it should appear, after the patient has been some time disposed in bed, that the purpose has not been perfectly attained by the first affusion, the case is to be re-considered with a view to ascertain the circumstances which marred the effect. These having been discovered, and removed by suitable processes of preparation, the affusion is to be repeated with all the additional assistances that new information may suggest for increasing its power.

Cautions.

The affusion of cold water may be made boldly and fearlessly at the commencement of the greater number of fevers, where the subject possesses the proper susceptible condition; it must be made cautiously and with a careful consideration of circumstances in the latter periods of most. Water of a temperature of 40 degrees of Fahrenheit's thermometer is, for the most part, sufficiently impressive

as applied through the sponge or by aspersion; at a temperature above 60, it requires to be dashed with force and in quantity from a bucket or large vessel, so as to assure the effect. Immersion in warm water, affusion of warm water, friction with warm oils and affusion of cold water act powerfully and salutarily on the animal system, as alternated with judgment and attention to circumstances; such alternations are in fact, however incongruous they may appear to the theorist, sometimes necessary to overcome torpor and to excite the impressible condition of the febrile subject. It must always be borne in mind that the affusion of cold water on the surface is improper, ineffectual or dangerous where deep congestion or strong inflammation exists in any of the interior organs; it is, at the same time, safe and effectual under fluctuating and irregular action wherever it may exist, more especially as applied directly to the suffering organ. In this manner, its beneficial effects are often conspicuous in febrile delirium as applied to the bare scalp, either descending from a height in a small stream, or as allowed to fall at once in quantity with force and impression. Inordinate thirst is sometimes extinguished by means of copious draughts of cold water swallowed with avidity. The principle of action is analogous; the thirst is extinguished, and the extinction of the fever, of which thirst is the prominent symptom, follows as a consequence of extinguished thirst. Instances of such occurrences are numerous in medical history. One of the most striking on record occur-

Cold Drink.

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plication.

Cold Clyster.

red to Baron Trenck while in prison at Magdeburg; and a very striking one occurred in my own person at Savanna, in Georgia, in the year 1779\*.

—I may add further in illustration of the principle that where pain, irritation and tenesmus constitute the leading feature of the dysenteric form of fever, the application of cold water to the lower part of the abdomen by wet cloths, or by immersion in a tub,—and even the injection of cold water into the cavity of the intestine by clyster rarely fails to give relief. The practice is not usual; but it is safe and grateful; it gives solace from pain, and even contributes to effect a decisive and final cure. But, though the application of cold water be a safe and effectual remedy in the local circumstances of disease now alluded to, the circumstances are not always easily discriminated. The cold water, whether by affusion, drinking, immersion or injection could not be supposed to be capable of producing any salutary or permanent effect, if the delirium, thirst and tenesmus were connected with real congestion, or actual inflammation in the membranes or substance of the brain, in the coats of the stomach, or in the coats of the intestinal canal; but, where the symptoms adverted to are contingent modes, constituting the prominent feature of the febrile action, its power is great enough to make impression, and, through that impression, not only to suspend the action temporarily, but even, in

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\* See treatise on the fever of Jamaica, 1791.

some cases, to arrest it permanently and thereby to cure the disease.

#### D. *Frictions.*

Besides the benefits derived from immersion in warm water or warm steam, from fomentations with flannels wrung out of hot water, or from modified forms of affusion—hot and cold, considerable effect, and sometimes important benefit is derived from frictions with soap and brushes, not only as freeing the skin from impurities, but as animating its torpid condition, and thereby restoring to it a higher susceptibility of impression than it previously possessed. But, besides the purification and animation of the skin resulting from the processes now mentioned, frictions with hot olive oil simply, or with liniments composed of olive oil, ammonia, camphire, oil of turpentine and tincture of cantharides have been employed by myself, or under my direction in different conditions of febrile disease with evident advantage. The conditions, in which the means stated are likely to do good, are so easily understood, that it is scarcely necessary to point them out, even to the least intelligent, the effect so simple and direct that it requires no reasoning to illustrate it. The friction is calculated to excite and to maintain in activity the energy of the cutaneous system. It anticipates or prevents the occurrence of internal congestion; it may even be supposed to aid in removing it where it already exists. It is thus power-

CHAP. VI. ful, as preventative in the earlier stages of fever; it is valuable, as auxiliary, in the more advanced.

E. *Gestation in Spring Carriages or other suitable conveyance.*

The good effects of gestation are striking in various conditions of febrile disease, so decisive on many occasions, as appears from the medical history of military campaigns, that I cannot, with propriety, abstain from mentioning them in this place. The limits of the work do not admit of any length of detail; I shall therefore confine myself to the bare history of the fact, offering only a very simple suggestion as to the nature of the cause on which the effect may be thought to depend.

The benefits of gestation first presented themselves to my own notice in the American revolutionary war, the first instance of benefit in my own person,—the effect rapid restoration of strength from a state of extreme debility. The experiment was repeated with similar benefit in other occasions; and it was applied in the year 1780 on a large scale, viz. to about one hundred and twenty sick persons, ordered to be removed from the Cheraws on the river Pedee to the head quarters of the army at Camden, a distance of more than 70 miles. The disease was in this case bilious remittent fever in various stages of progress, and, in many instances, of considerable violence. The subjects of it were placed in open waggons, exposed to a scorching sun by



day, dews by night, and occasional showers of rain. They were halted and took position on the third day at Lynch's creek, which is half way between the Cheraws and Camden; and, being mustered by myself, the majority of them were well, others were convalescent, and scarcely any one remained in whom the disease had not changed from obscure remittent to distinct ague and fever.—In the year 1794, the third regiment of foot or buff, (the corps through which I re-entered the army in the year 1793,) sent several detachments of sick to general hospitals at the earlier part of the retreat through Holland. I accompanied them to the hospital myself on some occasions, and I seldom failed to observe marks of amendment while they were on the route. In the latter part of the retreat, the whole of the sick of the Buff were carried in the rear of the brigade; and, notwithstanding severe frost at one time, rains and fogs at another, the progress towards recovery was more rapid and more secure, when the sick were on the march, than when they were stationary in quarters. In the year 1797, a corps of European soldiers, viz. the second battalion of the Irish brigade, stationed in the plain *Cul de Sac* in the island of St. Domingo, was ordered to *Port au Prince* previously to its embarkation for another destination of service. The sick were ordered to be removed at the same time with the effective part of the regiment. They were placed in waggons, followed in the rear, and arrived at *Port au Prince* about noon. The health of some of them was im-

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proved by the journey, even to convalescence; others were not benefitted, some perhaps were injured. Those, who were benefitted, had been bled largely at the commencement of the disease; those, who experienced no benefit, or who were injured, had been recently attacked, and no remedy, or no remedy of power had yet been administered when they were put into the waggons.

The good effects of gestation in the cases stated were accidental effects, the remedy, the prescription of necessity. In others, gestation was ordered as a remedy, and employed with a design and purpose in view. Where the design was formed with consideration, and the execution of it conducted with attention, the benefits were obvious—and for the most part important. Where spring waggons were at the command of the hospital department, a certain number of sick were carried out daily for exercise—in the mornings and evenings, or at noon according to the climate and season of the year. The practice was adopted and executed only desultorily; but, where executed with due attention to circumstances, it was observed that many who were lifted into the carriage by servants, descended from it, at the interval of two or three hours, without help, and walked to their apartments with comparative facility. Similar trials were made upon persons in the higher ranks of life, and almost uniformly with similar good effect. The remedy was here ordered with a design in view; it must consequently be supposed to have been ordered under a

given condition. The condition varied; it sometimes presented appearances of great ticklishness, or uncertainty of life; but where it was simple, whether the fever was epidemic or contagious, I had no hesitation, whatever might be the degree of exhaustion or debility of the subject, to have recourse to it; on the contrary, where the condition was complicated, manifesting inflammation, suspicion of abscess in the substance of internal organs, or threatenings of effusion into internal cavities, it was not recommended: it was then in fact peremptorily interdicted.

Gestation is not useful, not even safe, in every form of action which a febrile cause assumes; moreover, not safe or useful in every stage or condition of the same identical fever in the same subject. Slight febrile indispositions are sometimes turned off at their beginnings by gestation, or other exercise in the open air; the beginning of fever is not however the period at which the benefits in view are to be expected from this form of remedy. Fever is a disease of a peculiar movement, and, left to its own course, of a defined duration. It varies according to condition of subject and quality of cause; but it exhibits, in all its forms, occasional points of rising and falling within the extremes of the circle, implying action now more languid, now more intense. The application of stimulating power is felt most sensibly at the point of remission when the rapidity of the febrile course abates; and as this happens, sometimes after the third day, sometimes after the

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fifth or seventh, the stimulation of fresh and pure air, applied with impulse in rapid succession, by the progressive motion of a travelling carriage, contributes most powerfully, at that time, to bring back the customary action of health, even in a manner to assure its stability.

On this base, and it is a stable one, it is fair to conclude that the most proper occasion for submitting the patient to the influence of gestation, refers itself to that period of time when the diseased movement has completed its circle, or when it has become languid in its course, either by its own act, or by medical treatment, viz. abstraction of blood, the action of emetics, purgatives, diaphoretics, or other powers which remove complication and bring the system to a state of equal balance. Through whatever means this may be effected, the susceptible condition being, to a certain extent, thereby restored, the impulse of pure air, during progressive motion in brisk gestation, rarely fails to effect a salutary operation on the state of health. The same impulse makes no impression if the febrile action be strong and the course precipitous; it may even do harm if there be organic derangement, viz. inflammation, commencing suppuration, or commencing effusion into internal parts.—The affusion of cold water on the surface is not exempt from chances of danger, in certain delicate conditions of subject, during the febrile state, even aspersion sometimes requires to be made with caution; gestation, on the contrary, may be regarded as safe

under the most extreme degree of debility that can well be supposed to exist, provided there be no derangement in the structure of internal organs. This is a fact well ascertained; and, from it, I conclude that the simple character and the susceptible condition, however attained, present an opening for the trial of this remedy; that the complicated character, and the unimpressible condition preclude expectations of benefit from the effects of it. In this manner, gestation in the open air in wheel carriages promises no good in general fever with strong vascular action, or with oppressive plethora; it may even do harm by succussions and joltings, from the effects of which the structure of internal organs is in danger of being violated. Where inflammation already exists, whether in the head, heart, lungs, liver or intestines, no person of the least discretion would pretend to recommend it. Its effects are then injurious; on the contrary, they are beneficial where the action is fluctuating and irregular, and where its force is principally manifested on mucous membranes and other organs of secretion. On this ground, gestation presents itself as a remedy of great value at the advanced periods of the gastric, or bilious fevers of every country, but more especially of the fevers of hot climates and hot seasons, provided no actual derangement in the structure of internal parts accompanies them.

Besides the benefits derived from gestation in certain forms and conditions of fever, as now de-

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scribed, the good effects of the remedy are striking where disease has ceased; but where the return to healthy action is tardy and undecided, more strength is often gained by travelling for six hours in an open carriage, exposed to all the chances of uncertain weather, than would be obtained from nursing and pampering in well ventilated hospitals, or convenient private apartments during the space of six days. The greater the contrast between the condition of the sick apartment and the condition of the external air, independently of the mode of gestation, the greater is the impression and the greater the salutary effect upon the subject of the experiment. In this manner, the good effects of the gestation alluded to are conspicuous upon sick persons in the act of removal from infected hospitals or other infected dwellings. The act may then be considered as safe, in as much as the contagious fever, in its earlier stage at least, is rarely complicated with strong degrees of internal congestion. The benefit of gestation, as the simple act of motion in pure air, is considerable in itself; it is augmented by ablutions, by frictions and entire change of apparel before going out and after coming in. Gestation does not produce effects so instantaneous and so strong as the affusion of cold water on the surface; but it implies less hazard in cases of extreme weakness, and it even promises more permanent benefit, in as much as the means may be continued, not only until the salutary act be moved, but until its course be

confirmed; hence travelling from necessity, as occurs frequently in military service, is ordinarily more decisive of good than short airings in easy carriages, undertaken at the instigation and conducted under the direction of physicians.

The good effect of gestation, in certain conditions of fever, is perfectly ascertained by reference to the medical history of military service in different parts of the world. The more important of the conditions in which the remedy may be employed with a prospect of doing good, have been cursorily noticed in the preceding pages. The fact of the benefit cannot be doubted; the cause on which the benefit depends may be thought to be the following. The pressure or impulse of the common atmosphere may be considered as the direct agent which stimulates and supports animal life, which moves it into action when we first enter the world, and which recalls it when it is accidentally suspended at after periods. If it be admitted that animal life is excited, and its regular action supported by the impulse of atmospheric air, it is plain that the force of the impulse is necessarily augmented by the act of progression, consequently the force of the cause is increased. Hence, if there exist no extraordinary impediment to counteract the general impulse of the cause, the act of gestation in the open air is converted into a direct and powerful engine for moving and supporting the action of health; and, while powerful, it is of all others perhaps the most safe that can be applied to the animal machine in a state of debility.

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The remedial means already noticed, viz. abstraction of blood, warm and cold bathing, friction and gestation in the open air, are means which act upon the whole series of organs in the animal system. They are thus in some measure available in all the conditions of febrile action, whether to arrest what is wrong, or to excite, support and confirm the course of that which is right.—They are general and cardinal means; the greater number of the others, which remain to be noticed, apply to conditions that are more or less circumscribed,—or they are in themselves of inferior power only.

F. *Emetic.*

Emetics, of one kind or other, have been employed occasionally for the cure of fever from the earliest records of the medical art to the present time; and, like other remedies of power, they have had their periods of undue praise, or of unjust disparagement.—In certain forms of fever, particularly in such as arise in crowded barracks, crowded transport ships, ill ventilated and crowded jails and hospitals, the exhibition of a strong emetic at an early stage of the disease often cuts short its course abruptly. The cause is then dislodged, if one may so speak, during the first form of its action, and health is restored as a consequence of the dislodgment. On the contrary, emetics do no good, they even contingently do harm, where the habit is full, the arterial action high, the pulse hard and



tense, or small, deep and concentrated,—the skin thick and torpid, or where the functions of important organs, viz. head, lungs or liver, are oppressed by sanguineous congestion. In periodic fever; particularly in the bilious remittent of the autumnal season, the emetic is often the first remedy prescribed; and, in such case, its operation is not unfrequently beneficial, so beneficial indeed in many instances that the disease is arrested, or a condition induced by its action under which it is easily arrested by other applications. In catarrhal fever, dysenteric fever, eruptive fever, and, in short, in most fevers that manifest prominent action on the skin or mucous membrane, the benefits of the emetic are conspicuous. They mitigate the violence of symptoms; and, if they do not actually cut short the course of the disease, they prepare the way for its being easily and effectually cut short by others. It is not, I believe, usual to prescribe emetics, at late periods of fever where the patient is languid, exhausted, or oppressed; the remedy has notwithstanding been so employed by myself, and it has been employed with advantage, particularly where the movement is languid, or where the action is oppressed by congestion in the mucous membrane and other secreting organs within the abdominal cavity:—the effect is similar, whether the form be continued or remittent.

A prejudice exists with many practitioners against the use of emetics in the fevers of the West-Indies. Emetics, I am free to say, do no good,—they even

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occasionally do harm in the ardent and concentrated forms that present themselves in that country if given without preparation, particularly without preparation by abstraction of blood. But, though I do not then recommend them without previous preparation, truth obliges me to add that, even when so given, they do less harm than I was at one time disposed to believe. Those violent and irrestrainable vomitings which sometimes occur in the fevers of the tropical latitudes, and which are often imputed to the injudicious exhibition of emetics, I am disposed to think, arise from a modified action of the cause of the disease rather than from the action of the emetic itself; for I do not find, in referring to the case-books that are still preserved in the office of the Inspector of hospitals at Barbados, that vomiting was a more common symptom, or a more formidable one, where emetics were given in almost every case, which was the practice at one time with some, or where they were scarcely ever prescribed, which, as the same case-books shew, obtained at another time, or with other persons at the same time in other hospitals.

Mode of  
Exhibition.

The conditions, now noticed, are the more common ones under which emetics have been prescribed in febrile diseases. The remedy is a remedy of value; but it is not so indiscriminately. The circumstances of the patient and the manner in which he is treated, previously to the exhibition and during the operation of the remedy, materially influence the character of the effect produced. In some cases,

the abstraction of blood, even to large extent, is indispensably required to assure a safe and effective operation of the emetic; in others, the preparation of the stomach by tea, whey, warm water, or other beverage in which is dissolved a certain proportion, viz. fifty or sixty grains of salt of tartar or salt of wormwood, is no less necessary. This last form of preparation cannot be well dispensed with in lymphous habits where the tongue is foul, the saliva viscid, the mucous secretion adhesive and over abundant. Besides the dilution here recommended previously to the exhibition of the emetic, the stomach is to be washed out at intervals, during the operation, with alkalized infusion of chamomile or warm water. Further, as the operation of emetics is most effective, and the effect most salutary where the skin is warm, the patient is to be disposed in bed, the temperature of the apartment so regulated that the perspirable condition of the surface be easily maintained. As it is often seen that an emetic of severe operation arrests, or mitigates the force of the disease while a mild one has no beneficial effect, it is hence proper to administer emetics of severe operation in the stronger forms of fever, and to encourage the vomiting until the secretions, which are influenced by its action, be evidently changed, the existing action of the disease brought to arrest by faintness or other contingency.

Besides difference of effect, arising from the different manner of managing the patient during the operation of the emetic, difference also arises from

Ipecacu-  
anha.

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the different nature of the substance by which the effect is produced. Ipecacuanha is the one most commonly employed for this purpose; and it is perhaps upon the whole the mildest of those that can be considered as effective. It acts strongly on the mucous membrane; and, where the force of the disease is principally exerted on the secreting surfaces of that membrane, it is the best and safest of the emetic class. Where the functions of the principal organs which lie within the abdominal cavity, particularly the functions of the liver, are sluggishly and imperfectly performed, tartarized antimony is to be preferred. It acts more severely and for longer continuance; and it thus has more power to subvert actions that are diseased, and contingently, as a consequence, more power to stimulate into activity actions that are languid. It acts on some occasions so as to arrest the total course of continued fever; and it may be so timed in exhibition, and so directed under operation as to prevent the recurrence of the paroxysm of the intermittent, not unfrequently to prevent relapse whether of the intermittent or other form. Zinc, or white vitriol, another of the substances employed as emetic, operates speedily and safely. It acts powerfully upon the secretions of the mucous membrane, and, as such, it acts beneficially in *catarrhal* and *pituitous pneumonia*, the collected pituita being not only dislodged, but the secretion moderated, even suspended for a time after its operation.

Tartarized  
Antimony.

Zinc.

The ejection of offensive matter from the cavity

of the stomach, and, on some occasions, from organs of secretion that are nearly connected with it, presents itself as the direct effect of the emetic. The effect is ostensible ; but we are not, therefore, to consider the act of expulsion as the act upon which the benefits of the remedy radically depend. The surface of the membrane, to which the emetic drug is applied, excited into action by peculiar stimulus, experiences violent commotion in its structure, amounting to a subversion of the action which exists at the time, whether it be natural or diseased. The influence extends through continuous and similarly constituted membranes, even in parts that are remote. In this manner, the biliary secretion and secretions in parts still more distant, especially the cutaneous, experience commotion and change in their condition under the operation of strong emetics, a change which contingently involves a permanent change in the condition of the general health of the whole system. The emetic thus becomes a remedy of great power as given in the suitable condition, and as aided, during its operation, by every necessary accessory capable of improving its effect. A glass of brandy, a glass of spiced wine, a cordial draught of laudanum, antimonial wine, æther, or aromatic and spirituous tincture, given after the emetic operation ceases frequently do good by stimulating to a new action analogous with that of health, and even by contributing, in some degree, to maintain the salutary action in vigour after it is restored to its constitutional course.

G. *Purgative.*

Remedies of the purgative class occupy a prominent place in the catalogue of means employed for the cure of fever in the writings of both ancient and modern physicians; but they have not been, and are not even now always employed with similar views in similar cases of disease by different persons. Some interdict every purgative during the first days of the febrile course; others employ even those of harsher operation from the very commencement, repeat them at short intervals, and calculate on the almost certainty of carrying off the disease by alvine evacuation. The first wait, according to their theory, for a certain preparation of the offending matter termed coction before they administer the remedy; and it cannot perhaps be denied that, where such preparation is made, the action of the purgative contributes to render the crisis complete, at least more decisive than it otherwise would be, particularly in gastric forms of fever. The second combat from the beginning: they proceed on the view of diminishing the violence of the disease at all its stages—and they often succeed, to a certain extent, in certain forms of malady.

These views form the outline of the purgative practice; and it is evident to common sense that, where the force of the fever is principally exerted on the secreting surfaces of the alimentary canal, or on the function of organs in the abdominal cavity intimately connected with it, the action of strong

purgatives necessarily makes impression on the whole series of connexion, and not unfrequently produces favourable change on the character of the disease, directly or indirectly. If the purgative carry off offending matter, it palpably diminishes a cause of annoyance; and, if by stimulating to a new train of action in a part, it arrest the action of the disease in the part stimulated, it may be supposed to effect, or to contribute towards the effecting of a cure—partial or general, temporary or permanent as the case may be. On the other hand, if the febrile action be general, or if it be complicated with sanguineous congestion in any of the organs within the abdominal cavity, or with what is termed inflammatory action in the peritonæal coat of the intestines; in short, if there be sanguineous congestion, or active inflammation in any part within the circumference of the body, the exhibition of the purgative, simply as purgative, promises no material good; on the contrary, it is not unfrequently injurious. In this manner, the action of the purgative has appeared to myself to be equivocal in the higher degree of the ardent fever of the West-Indies—hurtful rather than useful. The strongest had no purgative operation, in many cases; or, if they acted, the action was irregular and by starts, the evacuation watery—unaccompanied by relief. In the bilious remittent of the milder form, the good effects were obvious; the effect was equivocal in concentrated forms with a dry, constricted and withered state of the skin.—The emetic, as already observed,

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cuts short the course of fever by its own power on some occasions: the purgative diminishes the violence of symptoms and renders the course comparatively regular; but my own experience does not warrant me to say that it absolutely and solely effects a cure.

Such, as has been stated, is the result of the operation of the simple purgative on the more common form of febrile disease as it presents itself without preparation. The condition is changed by preparation; and the operation of the purgative is thereby rendered more effectual than it otherwise would be. Of the various means employed to prepare the febrile subject for the exhibition of purgatives, the abstraction of blood may be considered as the principal. It restores general susceptibility by removing general or local congestions and constrictions; it thus renews activity of function among the organs of secretion. Besides abstraction of blood, which acts as now stated, a warm, or rather high temperature of the sick apartment, warm bathing, fomentations of the extremities with flannels wrung out of hot water, and frictions of the skin with warm oils may be regarded as means which forward the favourable operation of remedies of this class. Dilution with alkalized beverage, previous to the exhibition and during the time the remedy continues to act, more especially where the first passages abound with viscid and tenacious phlegm, contributes very materially to promote the good effect.



The simple purgative, whether salts, jalap, rhu-  
barb, aloes, colocynth, senna or magnesia, can  
scarcely be supposed to extend its operation beyond  
the limits and direct connections of the alimentary  
canal ; it cannot therefore be supposed to act mate-  
rially on the course of a disease which extends to,  
and acts in every part of the system. The simple  
purgative is thus limited as a remedy—temporizing  
and palliative. The sphere of operation is extended,  
the force augmented, and effect rendered decisive  
by combination with other means. Of compound  
forms, five or six grains of calomel, followed at an  
interval of some hours by divided doses of dilute so-  
lution of epsom salts and tartarized antimony, may  
be considered as one of the best in bilious remittents,  
particularly in hot countries. It is a common form  
—and it is upon the whole a good one. Jalap—  
with calomel, is more frequently employed by mili-  
tary practitioners, and it has superior advantages  
in many cases, particularly as combined with James'  
powder. Infusion of senna, with a certain propor-  
tion of kali, is suitable in some cases, particularly  
in the phlegmatic and pituitous habits. If a portion  
of antimonial wine, aqua ammoniæ acetata, occa-  
sionally æther or other aromatic and volatile tincture  
be added to the infusion of senna, the effect is im-  
proved, the evacuation thereby rendered feculent,  
and effectual of relief. Calomel, with extract of  
colocynth, &c. made into pills for the sake of ad-  
ministration, appears frequently among the purga-  
tive forms of medical officers of the army—and it is

Compound  
Forms.

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upon the whole a good one. A purging tinc'ure of aloes and myrrh \* is of peculiar excellence in some forms of gastric fever,—two drachms more or less for a dose. It rarely operates in less than twelve or fourteen hours after it has been given ; but, when it does operate, it produces evacuations more feculent and more effective than any other form with which I am acquainted. The operation is accelerated by the addition of a tea spoonful of æther ; the addition of one ounce of oil of turpentine often gives it great power. Where the bowels are torpid and the hypochondria inflated, as happens not unfrequently in the late stages of fevers of the gastric form, its good effects are signal. It is retained on the stomach where purgatives of a less offensive taste are rejected ; and, while purgative, it seems to stimulate the whole alimentary system to the proper exercise of its function.—Every purpose, that can be attained by means of purgatives, may be attained by one or other of the forms now noticed, singly or combined as the circumstances of the case may indicate.

H. *Diaphoretic.*

Natural diaphoresis usually attends, artificial diaphoresis apparently contributes to the purpose of

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\* Aloes barbadensis unc. ii.

G. myrrh unc. i.

Croci anglican. semunc.

Spirit. vini rectificat. unc. iii. stet per 24 horas & adde spirit. vini gallici lb. i. stet per sex dies & cola per chartam.

effecting a favourable termination of the febrile disease; and as the means employed for that end are various, and some of them not altogether harmless when misapplied, I shall briefly notice the leading conditions which define their use, that is, promote or mar the success and safety of the effect. There are two views, by which the application of the means intended to excite perspiration, are to be directed, viz. removal of artificial constriction from the organ of secretion by abstraction of blood, aided by fomentations of the surface with warmth and moisture; or direct stimulation by heating internal remedies and heated external air, intended to overcome resistance by something like direct force. The first is the safest—and it is the most effectual. It is even often indispensable as precursor of the second, where the second is ultimately in view; for, where the skin is constricted, thick and compacted, heating internal remedies, though they accelerate the circulation, rarely overcome the stricture of the surface so as to establish a free and copious perspiration throughout. Abstraction of blood, immersion of the body in warm water, fomentations with flannels wrung out of hot water, succeeded by the sudden affusion of cold water on the surface, constitute the principal of the first class of diaphoretics. Various internal remedies are employed in this view also—some of them more, some of them less directly stimulant. Of these, James' powder, compound powder of ipecacuanha, aqua ammoniæ acetata, and a compound of nitre, tartarized antimony,

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camphire and opium are the most common—the safest and the most effectual.—The above apply to cases where there is more or less of constriction, dryness and heat; where there is dampness, with a thick and greasy state of the surface without actual diaphoresis, snake root, contraerva, ammonia, salt of amber and ablutions with salt water, salt and vinegar, gestation in the open air, &c. may be employed with safety—and they are often employed with success. Among the means of establishing and maintaining diaphoresis, the adjustment of the air of the apartment is a matter of importance;—it ought to be pure and of rather a high temperature.

As the force and dangers of fever are often diminished by purgatives, given at short intervals during the course of the disease, so their violence is moderated, and the course conducted to a favourable issue in a somewhat similar manner, by means which maintain an equal and gentle perspiration throughout, such for instance as remove resistances—not such as extort sweat by excess of stimulation, whether these be drugs, wine, or ardent spirit; the effect of which, instead of being salutary, is often hurtful, even destructive of life.

I. *Mercury.*

Mercury has been employed and confided in, as a remedy of principal dependence for the cure of certain forms of febrile disease, viz. the hepatic and dysenteric, for many years past, particularly in the

East-Indies. Calomel alone, or combined with jalap, has also been long a remedy in common use with the medical officers of the British army, even with other practitioners in the West-Indies and North-America at the commencement of fevers, more especially at the commencement of fevers of the periodic class. This practice, as of old date, is well known and does not require to be noticed in this place. The present is comparatively new—and it is important, in as much as the introduction of it threatened, at one time, to constitute a new era in medical science. Dr. Colin Chisholm, of the medical department of the Ordnance, is generally considered as its author, by having brought it into use, and strongly recommended it in a malignant disease which appeared in the island of Grenada in the year 1793. If we allow ourselves to estimate the value of the remedy by the success of the effect exemplified in the Ordnance hospital at Grenada, we cannot rate it high; yet, notwithstanding the negative testimony produced on this occasion, the exhibition of calomel internally, and the application of mercurial ointment externally by friction with a view to induce salivation, dates from this origin; and the practice, in spite of failures, has extended further and maintained itself longer among medical men in the West-Indies, both in the army and in the civil community than almost any other known remedy. This being the case, it becomes necessary to examine the subject without prepossession, and to state the result candidly for the information of those who desire to know the truth.

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Numerous experiments, of what is termed the mercurial plan of treating fevers, have been made by the medical officers of the army since the year 1793; and, though none have been made professedly by myself, the steps of the process and its results have so often fallen under my observation in the course of my official duty as Inspector of hospitals that, I think I am warranted, from an unprejudiced review of the whole, to confide in the following conclusions, viz. 1. That where the disease is of the intermittent or remittent type, the intermissions or remissions distinct, the skin soft, thin, warm and perspirable, the pulse free and expansile; in short, where the symptoms are of a secondary degree of violence, the salivary glands are for the most part soon affected by mercury, whether given internally or applied externally by friction; and that where the salivary glands are affected, and a free and copious salivation established, the disease ordinarily abates in force, even sometimes ceases altogether. The rule is general, but not absolute. Instances occur, and not unfrequently, where the paroxysm returns after salivation is fully established; even some are recorded where death has not been averted though the reputed sign of safety was present. 2. Where fever is of the continued kind, whether endemic, epidemic or contagious, the symptoms violent, the heat ardent, the skin thick and compacted, dry and torpid as connected with excessive excitement and precipitate action, or thick, greasy, damp and inanimate as connected with constriction and

diminished energy of the capillary system, calomel is sometimes given internally in great extent, mercurial ointment being at the same time rubbed upon the surface in great quantity, without the salivary glands being in any degree affected by it: in other cases, the gums become spongy and livid, the breath emits the mercurial fœtor; but no increase takes place in the salivary secretion, and no change is effected on the course of the disease, which proceeds uninterruptedly to a fatal or favourable termination, independently of saturation of the system with mercury.

The conditions now described are extremes; they comprehend what is most important relative to the effect of mercury as a remedy for the cure of recent fever. 3. In fevers of slow movement and protracted duration, more particularly in such as are complicated with congestion in the more important organs within the abdominal cavity, the internal exhibition of mercury and the external application of it by friction, carried to the extent of producing more or less of ptyalism, has appeared to myself to be a remedy of value; in fact to be often the only remedy, especially as aided by medicated diets, by bathings, frictions, the occasional abstraction of blood in small quantity, with exercise by gestation, on which any dependence can be placed for effecting cure, or even for prolonging life:—it appears, as conducted in this manner, to operate changes on diseased organization, or to lay a foundation on which such changes as lead to health may be effectually operated by other means.

Slow Fevers.

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Dysenteric.

Mercury, in one form or other, aided by medicated diets, baths and frictions, is frequently employed in certain protracted forms of dysenteric affection—and its benefits, where it is properly managed, are important and well proved. Calomel with opium, and sometimes with the addition of ipecacuanha, has in a manner superseded all other forms of remedy for the cure of recent dysentery with several practitioners in British military hospitals. In these, I have seen it employed on a large scale, and employed so exclusively of other means of remedy, that I consider myself as entitled to speak with confidence of what it does effect. 1. Where the cause of the disease appeared to act principally on the mucous membrane of the intestines, and where the action was only of second rate violence, ptyalism or salivation was, for the most part, soon induced by calomel combined with opium. Where salivation was induced, the violence of the symptoms ordinarily abated, and the disease actually ceased in a few days, sometimes permanently, sometimes only temporarily. 2. Where the diseased action extended to all the coats of the intestines, particularly to the peritonæal, the benefits of the mercurial treatment, simply as mercurial, were very equivocal. It rarely made any impression, the disease proceeding in such case uninterruptedly to a fatal termination, or terminating by congestion in the mesentery and coats of the intestines themselves, so as to leave the patient valetudinary—sometimes for life.



The above is the sum of what I have to remark respecting mercury, as employed in different forms of recent fever and recent dysentery without artificial preparation of the subject. The preparation of the subject, particularly the preparation that is effected by abstraction of blood in the more concentrated fevers and more complicated forms of dysentery, is indispensable to the success of the primary effect, that is, to assure the action of the remedy on the salivary glands. The quantity of a thousand grains of calomel has often been given internally, ounces of ointment being rubbed at the same time upon the body externally, without producing the smallest increase of salivary secretion. In such case, the disease ran on to a fatal termination as if nothing had been done; in others, perfectly analogous, the abstraction of two, three, four or more pounds of blood changed the condition, in such manner, that a moderate quantity of calomel acted immediately and effectively on the salivary glands; hence, the saliva flowing freely, the fever, whether general or dysenteric, usually abated and often finally ceased. I leave it to the reader to form his own opinion, whether the effect belonged to the mercury or to the bleeding.—It has been the custom of late, with some of those medical officers of the army, who are prepossessed in favour of the mercurial plan of treating fevers, to give calomel in doses of a drachm or half a drachm after the subtraction of a large quantity of blood, viz. three, four, or five pounds according to the intensity of

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the symptoms. The salivary secretion is soon moved by this form of proceeding ; the disease is overcome, and mercury obtains credit for what, according to another, and perhaps a truer view of the case, is actually owing to abstraction of blood. If mercury be applied externally, or given internally without previous preparation by abstraction of blood or other suitable means, the salivary discharge rarely begins to flow before the third, fifth or seventh day of the disease, not generally until after one or other of the known critical periods of fever. The knowledge of this fact, obtained through observation of the progress of diseases, and confirmed by reference to case books still preserved in the office of Inspector of hospitals at Barbados, warrants the conclusion that mercurial action manifested by increased discharge of saliva, instead of being the cause which arrests or suspends the course of the disease by its own proper power, is no more than an indication that such suspension has taken place, either by a process inherent in the constitution, or by forcible means of art. Mercury does not act whilst the disease exists in force, that is, it does not counteract the progress of the morbid cause while action produced by that cause is in progressive activity. This is the fact ; the conclusion is important.

Upon the whole, I venture to say, and I say it with candour that if the results of what is termed mercurial treatment in fever and even in dysentery, particularly in British military hospitals where it has been most extensively tried, be correctly reviewed,

the high, or rather the extravagant opinion, which has been and which is even now entertained of the salutary powers of that remedy, is not well supported. The advocates of the mercurial plan of treatment generally assert that no one dies from fever after salivation is fully established. The assertion is not altogether correct; but even if it were, and if it appear, in a reference to hospital case-books, that there is one in three of the more concentrated forms of endemic fever in which calomel, given alone or in combination with opium to the amount of a thousand grains or more, produces no increase of the salivary secretion, consequently does not produce the effect which controls the fatal tendency of the disease, and if it appear, through the same channel of information, that the same disease when left to its own course, or opposed by ordinary means of treatment, does not destroy life to greater extent than one in three, those most prepossessed in favour of the remedy will not, it is presumed, venture to maintain that we gain any thing by the experiment; and it is evident that, if we gain nothing important, we lose time and chances of gain from other sources. But though the action of mercury, even where it does produce an increased discharge of the salivary secretion, is not uniformly decisive of the cure of fever, and though the occurrence of that action without artificial preparation by bleeding, or other means not implied in the plan of mercurial treatment, cannot be calculated upon as a

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certain effect, the practice still holds its ground, and probably will maintain it for many years to come. It hangs in a specious delusion, viz. on the expectation of an effect, uncertain, it must be confessed, in its occurrence, but commonly believed, when it does occur, to be in a manner specific of cure.—I abstain from further remark on the subject, only adding that if the case be viewed without prepossession, and if the hospital returns of the person who first adopted the practice at Grenada in the year 1793, and of those, who have pursued a similar practice in the different military hospitals in the West-Indies since that time, be admitted as documents of veracity, the arguments for the continuance of the mercurial plan of treatment do not appear to be strong.

The above remedies, the mode of operation and effects of which I have now adverted to, are calculated to arrest the febrile course abruptly, or to moderate its violence and diminish the danger of its action. The most of them are depletory, either of blood or secreted humours; consequently the effect is visible in the functions and offices of organic structures. Besides the depletory, which are employed principally with a view to arrest or change the existing morbid action, there is another class of remedies employed to prevent recurrence after the action has been arrested artificially, or ceased temporarily of its own accord:—these are usually termed tonic.

K. *Peruvian Bark.*CHAP.  
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Peruvian bark stands at the head of the list of tonic remedies on account of its power and safety. Its efficacy in preventing the recurrence of febrile paroxysms is acknowledged and generally confided in; it notwithstanding sometimes fails as applied to improper conditions. The discrimination of conditions is important, I shall therefore endeavour to define them, in so far as I am able. 1. Bark, when of good quality and given in sufficient quantity, rarely fails to prevent the recurrence of paroxysms of the distinct intermittent fever where the paroxysm terminates by copious, fluid and warm perspiration, where the skin is soft, warm, sensible and animated, the pulse soft, free, expansile and more frequent than natural, where no marks of constriction or congestion are perceivable in the organs of secretion, and where the power of sensibility is acute, or preternaturally increased throughout the whole system. 2. Bark, even of the best quality, is often given in large quantity without beneficial effect where the paroxysm, instead of terminating completely by copious, fluid sweat or other evacuation, subsides silently and imperfectly by partial clammy perspirations, where the pulse, during the period of subsidence or intermission, is hard and tense, or deep and concentrated, small and irritated, obscure, creeping and oppressed, where the skin is dry, constricted, torpid, thick and compacted, where the bowels are torpid—little obedient to the

Favourable  
Condition.Unfavourable  
Condition.

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stimulus of purgatives, where the urinary secretion is irregular, and other secretions more or less impeded, where there are marks of general plethora, or stagnation in the venous system, known by a dark or scurvied colour of the skin, where there are marks of congestion—sanguineous or lymphous in the substance of important organs, viz. liver, lungs, head or spleen; and finally, where the function of the sentient system is unusually disordered, its susceptibility suppressed generally, or its irritability increased and irregularly balanced, expressed by fretfulness, restlessness and other forms of distress. Bark ordinarily fails in the circumstances described. It failed frequently in the fever which prevailed among the British troops at the siege of Flushing, and during the occupation of the island of Walcheren in the year 1809. I had not the opportunity of judging the case otherwise than by conjecture; but I am disposed to believe that it was owing to a condition, in some degree similar to the above, that its failure was to be ascribed. It fails frequently, perhaps generally in the more concentrated of the periodic fevers of the West-Indies as given without preparation, or with no other preparation than such as follows an emetic or purgative. This I admit, for I have seen it often proved; but I add at the same time, and I speak from experience, that the effect may be rendered sure by previous preparation and proper combinations during exhibition, in so much as not to fail once in a hundred times in cases of the genuinely intermit-

Condition  
produced  
by prepara-  
tion.

tent type; it is not to be depended on, for the precipitate arrest of the remittent, either in the West-Indies or in other countries. The remittent, I may add, proceeds in a defined course, to a given critical termination, in spite of the largest quantities of bark that are given to arrest its progress. I formed this opinion on the subject, from what I observed of the fevers of Jamaica between the years 1774 and 1778, and I find the truth of it confirmed by what appears in the case-books which still exist in the Inspector's office at Barbados. The cases, in the books referred to, were taken down and recorded without any view to the present question. I analyzed them, and, in analyzing them, found that the terminations were generally on critical days, the progress of the disease, in reality, not arrested by the treatment.

I have stated the fact historically as it has appeared to myself through a long course of experience; and as it is evident, from the history given, that there are various conditions in the animal system, when under the action of a febrile cause, which counteract the power, or render void the impression by which peruvian bark prevents the recurrence of the febrile paroxysm, it may be thought necessary that I explain, in so far as I am able, what these opposing conditions are, and that I notice the means by which they may be most easily and most effectually removed. 1. No reliance can be placed on the action of peruvian bark as a remedy against the recurrence of the paroxysms of the

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intermittent, where venous plethora, general or local, exists to any extent in the system, where the foundations of congestion, or changed structure already exist in any of the important internal organs, where animal sensibility is impaired—suppressed generally, or irregularly balanced in the different series of parts, where the skin is constricted and close, or damp, greasy and torpid;—in short, where ever susceptibility to impression is diminished or obscured, whether through open or latent action, the operation of bark is uncertain, the effect rarely salutary. 2. Bark, on the contrary, rarely fails to do good, even to arrest the disease, where sanguineous plethora and other congestions are removed from every part of the system, where circulation is rendered free and equally balanced throughout, where the spirit of animation is equally diffused to all parts of the surface, and where susceptibility to impression is higher than the natural degree, whether produced by inanition from abstinence under the continuance of the disease, or by artificial depletion at an early period. It being thus evident that the conditions of subject are different as the case presents itself, it necessarily becomes the first step in the physician's course to bring the differing conditions to a level standard by artificial preparation, previously to the exhibition of bark as a remedy. The means to be employed for that purpose are similar to those employed for the affusion of cold water on the surface, viz. abstraction of blood to greater or lesser extent, emetics, more



particularly antimonial emetics, purgatives, particularly those that operate actively and extensively, diaphoretics and attenuants, tepid baths, and, on some occasions, the application of blisters to the neck and spine.

Where the condition suitable for the exhibition of bark is present, whether existing naturally, or produced artificially, it is proper that the remedy, either simply or in combination with such others as increase its power, be given in cases of intermittent to the quantity of two drachms every other hour. The quantity may be increased to half an ounce or more, where life is threatened with danger if the recurrence of the paroxysm be not prevented. On the contrary, doses of two scruples, or of one drachm at most at the interval of three hours, are more suitable in the remittent.—The quantity stated has appeared to myself to be sufficient to guard the habit against untoward accidents, and no quantity appeared to me to be sufficient to arrest the course of the disease by force.

Mode of  
Exhibition.

The effect of peruvian bark, as preventative of the recurrence of febrile paroxysms, having been stated historically, and the conditions of habit under which the effect is attainable having been noticed cursorily, it may perhaps be expected that some opinion be given, or some conjecture offered concerning the identical mode of action through which the effect is attained. As the course of the disease is arrested by the exhibition of bark without the production of any visible operation, at least with-

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out the occurrence of any sensible evacuation from organs of secretion, it is reasonable to suppose that the remedy acts on the solid fibre, changing its condition, and, by some inexplicable operation on the tonic power, diminishing its irritability in such manner that the periodic recurrence of the febrile cause fails to excite the periodic febrile irritation. Where the disease is without complication, the more relaxed the habit and the greater the general mobility of the locomotive power, the more certain is the repressive effect of the remedy. If this be so, and the fact is proved by history, it is fair to conclude that bark conveys to the fibre, as already suggested, a certain imperceptible and undescribable condition, whereby the impression of contingent stimulations, and, among these, the stimulation of the cause of periodic fever is resisted. It gives firmness and elasticity to the muscular fibre, force and energy to the locomotive power, imparting to the habit a species of vigour and activity not unlike that which is derived from exercise in open and pure air.—It is upon the whole a safe remedy. It is admitted that it does not arrest the disease, or that it arrests it only temporarily and imperfectly, if the condition under which it is given be not the proper one; but in a long course of experience, and with numerous opportunities of seeing it fail of doing what was expected from it, I have seen very few instances of its actually doing harm, where the matter was sifted to the bottom and the real act of the remedy fairly ascertained.

There are other remedies, besides peruvian bark, which have been employed occasionally for the purpose of preventing the recurrence of the paroxysms of intermittent fevers; and, of late years, a solution of *Arsenic*, prepared according to a form of Dr. Fowler, has been much used, and much celebrated by military practitioners for its beneficial effects. Arsenic appears to me, though my experience of it is not very extensive, to suppress the paroxysms of intermittents as complicated with visceral obstruction more effectually than bark, according to the manner in which bark is usually given; but, though I am convinced of its safety as given with requisite precaution, I have seen nothing in its act which induces me to recommend it, in preference to the common remedy in recent and simple cases of intermittent. Besides arsenic, *White Vitriol*, or *Zinc* is sometimes employed for the cure of intermittents—and not unfrequently with success. It is a safe remedy, and an useful one in intermittents connected with the lymphous constitution, even where there is more or less of congestion in organic structures, especially in mucous membranes:—its virtues are improved by the addition of rock alum.

### L. *Wine, Brandy, &c.*

*Bark, Arsenic, &c.* seem to prevent the recurrence of febrile paroxysms by a peculiar operation on the tonic power of the system, thereby dimi-

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nishing irritability, or changing the condition of aptitudes; wine, brandy, &c. act by direct stimulus: they are calculated to support the activity of life in a given course; they do not, as given medically, arrest, or subvert the base of the existing action.—The history of this class of remedies is perplexed and contradictory of itself. At one time, and with one class of physicians, wine, brandy and other cordials were considered as injurious, consequently peremptorily interdicted; at another time, and with other men, they were considered as means of principal dependence, consequently warmly recommended. It would be a vain and useless labour to attempt to reconcile this difference of opinion. It originated in theory,—a theory without a base, and moreover so dogmatically pronounced, its truth so implicitly relied on, that the chances of observing effect accurately were precluded by prepossession. If the cause of fever be stimulant, the action direct excitement, stimulants, which raise the febrile action to a higher scale, cannot be supposed to be proper, or conducive to cure by direct effect; if the cause be sedative, the act depressive, the stimulant presents itself as a direct remedy. As it does not belong to this place to enter into formal discussion on controverted subjects, I shall content myself with stating the historical fact as it has occurred within my own observation.—The French and German medical officers, whose treatment of sick soldiers it has been my duty occasionally to superintend, were in the habit of subtracting stimulating

matters of every kind from patients in the early stages of fever; the British had, on the contrary, a national bias to indulge, even to stimulate; inso-much that during a certain period of the war 1793, stimulation, by wine and brandy, was often carried to excess in British military hospitals, even from the beginning of the disease. Such is the fact: the final result, I may add, was not precisely the same in the French as it was in the British hospital; but it was less different than might have been expected if the view in either case had been founded on a true base.

In fevers, which occur in sanguine habits, and which manifest force and energy of vascular action, wine or other cordial is evidently superfluous: it is even worse than superfluous; if the habit be full, the action highly and irregularly excited in particular organs, the chances are that it may be injurious. The preternaturally excited action may here be supposed, by doing violence to the delicate structure of vessels, to occasion extravasation.—It sometimes actually does so; but, while it does this on some occasions, it sometimes also gives relief by exciting perspiration to such extent as to change conditions, and thereby actually to accelerate a favourable termination. In fevers which occur in the lymphous temperament, particularly in such as occasionally obtain the name of typhus, the injuries of wine or other cordial at early periods are less to be dreaded; the benefit is, in fact, obvious and important on many occasions. The action of the cause is com-

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prehensible. If the moving power be kept under artificial impression by means of well measured powers of stimulation, the force of the febrile act is absorbed, that is, to a certain extent, immersed in the action of the remedial stimulus: local congestions are prevented from taking place; and, when the means are judiciously managed, they are even sometimes altogether removed by it; if the foundations be not deeply laid. Wine and other cordials are, or may be employed with benefit as auxiliary in the cure of many forms of fever; they are scarcely to be considered as sole or principal in any. I admit that it is only by stimulations that the course of fever is arrested, as well as that it is by a succession of stimulations that animal life is supported in a state of efficiency; but I may venture to say that wine and brandy, though often grateful to the taste and corresponding with the prejudices of the patient, are not the means which best effect the purpose; they are, at the highest estimate, auxiliary only.

We have no just ground to proceed upon, for the institution of the artificial preparation which renders the effect of wine or other cordial decisive of the cure of fever; for, though wine acts favourably where the animal power is depressed, or its activity dormant, there is no good reason to expect that an absolute arrest of the disease will follow from a high dose of the remedy—not even from intoxication. This however, has sometimes occurred, though not often. If it does occur, it is a contingency which

cannot be calculated, and on the chances of which no discreet physician would venture to act: the rule, therefore, which must be the guide in the employment of wine as a remedy in fever, is a rule of experiment only.

In continued fevers, in the lymphous habit, wine, or, where wine is not sufficiently powerful to make impression, brandy, given at measured intervals for some time preceding the critical or dangerous period, is often a remedy of value. It is to be given in such quantity, and in such quantity only as makes an effective, but safe impression on the system. The rule of judging the time and quantity is to be drawn from the increased animation of the pulse, and often from the increased confidence which arises in the mind of the patient under its operation. I think I may venture to say that the chances of fatal depressions are diminished by wine or cordials exhibited in the manner stated, even that death, if one may so speak, is sometimes warded off by the artificial defences thus opportunely interposed. To this I may add, that the exhibition of wine, or other powerful cordial, has often a propitious effect in malignant periodic fevers, where given with a view to anticipate the recurrence of the paroxysm, and given in quantity sufficient to impress the system with that form of action which is peculiar to wine. The effect, if the adjustment of all things be well concerted and well applied, is often, I am warranted to say, decidedly favourable; but in order to be so, the application must be nicely

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adjusted. It cannot be intrusted to a common nurse, or to the orderly of a military hospital,—so intrusted, it has perhaps done more harm than good.

Porter.

Besides wine and brandy, bottled porter is often prescribed as a remedy for febrile subjects in military hospitals. Porter is more generally relished by British soldiers than wine, and its effects are in fact more cordial and more refreshing to this class of

Champaign.

people than the effects of any other liquor. Champaign wine has advantages over all others in cases of depression in continued fevers, and more especially as given by anticipation in prevention of the depressive tendencies of paroxysms in the treacherous periodic; but it is rarely given, for it is a remedy within the command of the rich only. Ammonia, æther, salt or acid of amber, are among the powerful of officinal stimulants. Their effects are of short duration; and they are only available by those who narrowly watch, or in a manner nurse the sick. Employed with judgment, they contribute, with other means, to rescue patients who are in desperate conditions from the hands of death; but they are not general remedies.

M. *Opium.*

Opium is another of the remedies frequently employed as auxiliary, even sometimes employed as principal for the cure of fever. Its credit was high a few years since, even so high with a certain class of practitioners in Great Britain as in a manner to



supersede every other curative means, except wine. The practice originated in the metropolis of Scotland. It was adopted in the British army, and experiment was made of it on a very extensive scale at the earlier periods of the war 1793. The results cannot be said to have been fortunate; for while the sickness, both at home and abroad, was ordinarily high in proportion to the number of the troops, the mortality was great in proportion to the number of the sick. Opium was considered at that time as the sovereign remedy in typhus fever; and the fevers which then appeared in the army were generally designated by that name. They were in reality contagious fevers—originally so, or rendered so by mismanagement, viz. accumulation of sick persons in ill ventilated hospitals. Opium was here the remedy of principal trust; but, in so far as I was able to judge from my own observation, it did not act decisively on the course of the disease; while, by obscuring the natural expression of its character, it often masked the dangers and misled the physician in forming prognostic of the issue. But, though opium has no claim to be considered as a general remedy for the cure of fever, it is notwithstanding a remedy, when properly applied, capable of affording relief from pain, and even of sometimes averting the dangers that threaten life. It is, or it may be useful where the action of the fever is irritative, irregular and fluctuating; it, on the contrary, is not useful, it is even often hurtful in local congestions or suppurative inflammations in internal organs. It is to be

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avoided in pituitous and viscid secretions, viz. in the form of disease termed *peripneumonia notha*, characterized by agglutinating effusions of lymph into the cells of the lungs.

Mode of  
acting.

Opium ranks directly among stimulants. The effect, as viewed superficially, is stimulant at one time, sedative at another ; but, as the laws of animal economy are consistent, it is reasonably to be inferred that the operation moves radically on the same base in both. Where the action of the disease is principally manifested on the organs of the sentient system, the influence of opium, as acting principally and directly on sensation, supplants the existing action by engrafting its own ; hence it is observed that violent febrile delirium and violent muscular agitations, especially in paroxysms of fevers of the periodic class, are often restrained, even sometimes perfectly overcome by a large dose, viz. a hundred drops or more of the tincture of opium. The quantity, required to produce the effect, corresponds with the violence of the irritation existing at the time, that is, the force of the diseased action requiring arrest or controul. In this manner, one hundred and fifty drops of tincture of opium may be given in a plethoric state of the system with strong irritative action, pains and spasms, without producing any material effect ; five and twenty, or thirty may be regarded as a full dose where the habit is rendered susceptible by artificial evacuation or inanition,—fifty or sixty may then be dangerous.

Opium is a remedy of power ; and the exhibition of it in practice according to my own opinion is to be regulated by similar considerations as those which regulate the exhibition of wine, or strong liquor, viz. given in quantity to effect its own impression at the dangerous periods of the disease, particularly previously to the expected return of paroxysms of fevers of a malignant or treacherous character ; of such at least as are accompanied with unusual despondence and depression of mind, or as manifest a disposition to spasm, convulsion or other mode of irritation. As the effect of opium, like the effect of other remedies, corresponds with the existing condition of the subject to which the remedy is applied ; so the good effect is augmented by combining with it such other means as bring out the favourable condition, or as improve it when already existing, more especially by the use of external fomentations and the internal use of diaphoretics.

#### N. *Cob Web.*

The spider's web, and even the spider itself has been, and still is employed by the vulgar of some countries as a remedy for the cure of ague and fever. It is known to some old women and employed by them to some extent ; but, when mentioned by medical writers, it is for the most part mentioned only to be ridiculed ; or, if admitted to be effectual, it is supposed to produce effect through the abhorrent impression connected with the idea of swallow-

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ing a spider, or a spider's web. It is within my own experience to establish its claim to all the virtues that have been ascribed to it for the cure of intermittents, even I believe to demonstrate to the conviction of the most prejudiced that it possesses virtues, in allaying pains and spasms and other forms of irritation, superior to opium or any known remedy, without owing any thing to the idea of abhorrence; for, as given by myself, the patient has always been altogether ignorant of the nature of what was given to him. The knowledge of the virtue of cob-web, as a cure for intermittents, is old and vulgar; but it was not until the beginning of the present century that I knew that such virtue had been ascribed to it. Soon after I obtained the information, I found an opportunity to ascertain the fact. Some cases of intermittent fever, the most of them imported from foreign countries, had been long in the sick list of the Army Depot hospital in the year 1801. They had obstinately resisted, or only temporarily yielded to bark, arsenic or mercury, employed singly or in alternation and administered with every possible attention to the circumstances of the case. The effect of cob-web, in suppressing intermittents, had been mentioned to me some short time previous by the late Dr. Gillespie of Edinburgh. Perplexed by the obstinacy of the cases in question, I determined to make trial of it; and, with this view, directed that a quantity of the purest cob-web that could be found in the cellars of the hospital should be collected, and made

into pills of four or five grains each. Four persons were selected as subjects of experiment. To each of these, two pills were given, with my own hand, at intervals of two hours, commencing six hours before the usual time of the return of the paroxysm. The remedy, thus administered, acted like a charm:—the paroxysm did not return, and health was restored,—in some speedily, in others slowly. The success of the trial was more than expected; and, as cob-web seemed, from this experiment, to be a substance of power, cob-web pills obtained, from that date, a place among the formulæ of the hospital pharmacy. According to the practice adopted at the depot hospital, the more ordinary formulæ were carried in a tray by a dispenser at the time of the visit, given when they were prescribed, and given under the eye of the person who prescribed; consequently an opportunity was thereby afforded of noticing the immediate and direct effect of their action. It was observed on this occasion that where cob-web was given in the manner stated, previously to the expected return of the paroxysm, the return was prevented; where it was not given until after the paroxysm had commenced, the symptoms of distress vanished under its exhibition, and the patient speedily regained his usual state of health. It was also remarked, in making these experiments, that cob-web not only arrested the course of intermittents, but that it removed, often in a sudden and extraordinary manner, the various forms of irritation, pain, spasm, delirium, vomiting, griping in the bowels and other

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threatening symptoms which are common in continued fever; such, at least, as are principally manifested on the sentient system and organs of locomotion;—it was of no marked value where congestions or inflammations existed in the substance of internal organs.

I had been in the habit of prescribing cob-web as a remedy in various conditions of fever from the year 1801, and had great dependence on its virtues in many. It did not appear to me, when I compared the substances, that the web which is produced by the spider within the tropics is of the same nature as that which I had employed in England; I therefore included cob-web in the list of medicines required for the Windward and Leeward island station in the year 1812. The requisition was given to the Apothecary-General. He failed to procure it; the Director-General of the medical department of the Ordnance had also been applied to by the surgeon of the Ordnance. He was more fortunate, or more industrious. The Ordnance surgeon, stationed at Barbados, received a considerable supply of it; and, with what was thus furnished, experiments were made at that place to considerable extent;—the result corresponded with what is stated above. The cob-web failed in no instance, as administered by the surgeon of the Ordnance, to prevent the return of febrile paroxysms of the distinctly intermitting type; it even rarely failed to relieve the more alarming symptoms of the remittent or continued, unless of such as depended on congestion, or actual inflamma-

tion in the membranes or substance of internal organs. It failed in two cases, and in two cases only of distinct intermittent in the West-Indies—in so far as fell under my own observation. The subjects were both mulattoe boys. One of them had contracted the disease at St. Lucia; the other, in the district near Montego Bay in Jamaica. It was given to the first without sensible effect; in the second, it was given and failed likewise, but the experiment was not fairly made.

I have stated briefly the manner in which the spider's web was first introduced by me among officinal remedies, and noticed the general result of its action. I think I may venture to say that it prevents the recurrence of febrile paroxysms more abruptly, and more effectually than bark, arsenic, or any other remedy employed for that purpose with which I am acquainted; but that, like all other remedies, it is only effectual as applied under a certain condition of habit:—that condition is however of great comparative latitude. The cob web was rarely given before the subject was prepared by bleeding, emetics or purgatives; and, given to a subject so prepared, it seldom failed to effect a cure comparatively permanent; in so much that relapse, or conversion into another form of disease was a rare occurrence where the intermittent had been suspended by this remedy. If the cob-web was given in the time of perfect intermission, the return of the paroxysm was prevented; if given under the first symptoms of a commencing paroxysm, the symptoms were sup-

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pressed, and the course of the paroxysm was so much interrupted that the disease for the most part lost its characteristic symptoms; if not given until the paroxysm was advanced in progress, the symptoms of irritation, viz. tremors, startings, spasms and delirium, if such existed as forms of febrile action, were usually reduced in violence, sometimes entirely removed. In this case, sleep—calm and refreshing, usually followed the sudden and perfect removal of pain and irritation. Vomiting, spasms and twisting in the bowels, which sometimes appeared as modes of febrile irritation, were usually allayed by it; there was no material or permanent effect from it where the vomiting, or pain was connected with real inflammation, or progress towards disorganization. In cases of febrile depression, deficient animation and indifference to surrounding objects, the exhibition of eight or ten grains of cob-web was often followed by a peculiar kind of exhilaration, sparkling of the eye, temporary animation of the countenance, &c; and, though the course of the disease might not in such case be changed or the dangers averted, more respite was obtained from a pill of cob-web of ten or twelve grains than what arises from, or belongs to the action of wine, opium, or any thing else within my knowledge.

Further, the power of cob-web has been tried, and its good effects have been proved in other forms of irritation besides those that are strictly febrile. In spasmodic affections of various kinds, in asthma, in periodic head-aches, in general restlessnesses



and muscular irritabilities, its good effects are often signal. The cob-web gives sleep, but not by narcotic power;—tranquillity and sleep appear on this occasion to be the simple consequence of release from pain and irritation. Cob-web has also been applied locally, under my own eye, to ulcerated and irritable surfaces with singular good effect. The pain which it occasioned was sharp; but it was momentary; and the surfaces, which had been painful, irritable and untractable to other applications for weeks or months, ordinarily healed up in the course of two or three days:—the experiment was made on superficial sores only.

I have not made a chemical analysis of cob-web, for my chemical knowledge is not of the kind which would enable me to conduct such an operation correctly. The cob-web may perhaps be thought to belong to the class of poisons; but it is somewhat singular that I have not been able to discover much difference of effect from a dose of ten grains and from a dose of twenty. The changes induced on the existing state of the system, as the effect of its operation, characterize it as powerfully stimulant.

1. Where the pulses of the arteries are quick, frequent, irregular and irritated; they often become calm, regular and slow—almost instantaneously after the cob-web has passed into the stomach; the effect is moreover accompanied for the most part with perspiration and perfect relaxation of the surface.
2. Where the pulses are slow, regular and nearly natural, they often become frequent, small,

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irregular—sometimes intermitting. 3. Where languor and depression characterize the disease, sensations of warmth and comfort are diffused about the stomach, and increased animation is conspicuous in the appearance of the eye and countenance. 4. The cob-web, applied to a bleeding surface, occasions a very sharp and transient pain—the bleeding instantly ceases.—The cob-web here recommended is the produce of the black spider which inhabits cellars, barns and stables; that which is found upon hedges in autumn does not possess the same power, if it be actually of the same nature.

#### O. *Blisters.*

Vesication of the skin by means of *Cantharides* has long had a place among remedies employed for the cure of fever; but the mode of operation, through which the beneficial effect is attained, is not yet so explained by theorists as to imply a consistent or uniform rule for the direction of the practice. It is frequently observed that the superficial irritation of a blister diminishes the force of deeper internal irritation, consequently the remedy acts sedatively; it is also observed that the application of a blister often produces something like general excitement throughout the whole system, consequently it apparently acts by stimulation. The ostensible effect is contradictory; the basis of action is one. The existence of local pain, whether deep or superficial; the depression of vital power from oppression or

exhaustion, comprise two general conditions which influence practitioners in the application of blisters. The benefits of the remedy are decided, if the habit be susceptible; they are void, if susceptibility be deficient. For example if, together with internal local pain, there be high fever, a strong, hard and irritated pulse, a dry, thick and constricted state of the surface, or a damp, greasy and deficiently animated skin, the effect of blisters is equivocal—not always safe. It is also equivocal, where the principal action of the disease manifests itself in the interior of spongy organs, viz. brain, lungs, liver or spleen; it is more certain, and often more favourable, where the principal force is manifested on excretive membranes, particularly the mucous. Blisters are often resorted to as a last remedy in what is called the sinking state of fever; they then often fail, consequently lose credit;—and they lose it unjustly, in as much as they are applied to a case beyond remedy in itself, or irremediable in neglect of preparation. The physician who observes, and who reflects on what he observes, will be at no loss to determine what form of preparation is most suitable to the individual case before him, prior to the application of the remedy, viz. whether bleeding, emetic, alvine evacuation, or bathing, friction and internal cordial. According to the correctness of the view will be the success of the effect. The preparation consists in rendering the habit susceptible throughout. This is done by moderating or removing internal congestions, or irregularly excited

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organic actions, and by inducing, upon the skin, a higher relative degree of sensibility.

Instead of applying blisters with a view to moderate symptoms and diminish dangers, I often apply them with a view to prevent the recurrence of dangers that have been removed by previous treatment, or that recur periodically as a condition in the character of the disease. For example, after the course of a violent continued fever, whether simple, or complicated with prominent local pain, has been arrested; after pain, where pain existed, has been removed and the habit rendered susceptible by bleeding, bathing or other means, the application of a large and strong blister to the nape of the neck, to the temples, head, breast or sides, according to the circumstances of the case, is a practice which I have followed for a long time past. I consider it as an important one—preventative of recurrence, and thereby effective of final cure. I have moreover been in the habit of applying strong blisters to the nape of the neck, to the temples, to the wrists, to the ancles, or to the inside of the thighs, about six hours or more before the expected return of the paroxysm of fevers of a suspicious or treacherous character. The practice is precautionary—instituted in the view that the system, as brought under artificial impression by the action of the blister at the time of the customary return, may be less susceptible of the impression of the disease, at least of its dangerous tendency, if it actually do return, than it otherwise would be. The trial was made originally through

a suggestion of theory; it has answered expectation in practice. In the more advanced stages of fever where the powers of life are impaired, whether through exhaustion, or by oppression, blisters, applied to one part of the body or other, usually have a place among the prescriptions of physicians. I have to remark on this head that, if the action be equally balanced throughout, only deficient in force generally, the energy is for the most part perceptibly increased by the stimulation of a blister; and, while increased, it is longer sustained by such form of stimulation than by internal cordials. On the contrary, if, together with expressions of languor and debility, there actually exist congestions in the substance of internal organs, the habit is irritated, the obstinacy of the disease is even sometimes increased by such application. When the congestion is removed by suitable means, the blister is available as a remedy. I consider blisters as cardinal means of safety against the recurrences of treacherous fevers. They have appeared to myself to be most effectual in that view as applied to the nape of the neck, extended down the spine to the interval between the shoulders—to the head—behind the ears—and to the temples. For removal, or in prevention of the recurrence of local pain, they are best applied to the seat of the pain, or as near to it as possible; and, for purposes of general stimulation—to the inside of the thighs, the calves of the legs, ancles and wrists.—Wherever it is necessary to apply blisters, it is proper to wash the part previously with

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vinegar, or spirits;—if the skin be torpid, a solution of volatile alkali is more effectual. I confide in the early application of blisters, as auxiliary in prevention of recurrence where the course of fever has been previously arrested; and, as I have practised the experiment myself with good effect, I cannot abstain from recommending to others that, where the fever is of a suspicious character, blisters be applied in succession every other day, until the usual periods of recurrence be past and signs of re-established health manifest: applied in this manner, I consider them as means of safety of considerable value.

#### P. *Antiseptic.*

The greater number of the remedies, which have been noticed in the preceding pages, are such as effect changes in the existing state of things by diminishing quantities, or stimulating to new forms of action by forcible impression. To these may be added another class, supposed to influence health by inducing changes on the condition of the fluids within the body, independently of expulsion or evacuation. Among these may be reckoned *Yeast*, which has been recommended and even given in certain forms of fever to great extent; and, according to report with great benefit. On this subject, I may remark that I have seen it tried in the hospitals which were under my superintendence with advantage, but never with such advantage as in any degree justified the praises which were bestowed upon it. The *Essence* of

Yeast.

Spruce.

*Spruce*, which ranks itself in the same class, has also had its day of fame. It was considered at one time, particularly among sea-faring people, to be almost a specific for the cure of the yellow fever of the West Indies. Its credit was not established by correct experiment; for though when given at the very commencement, or given in very slight forms of fever, it often acted as a purgative, or as a diaphoretic, and thus was of benefit; it was of no benefit, even in the largest doses, in the severer forms, or at late stages. The *Mineral Acid*, particularly the *Muriatic*, stands frequently among the prescriptions of physicians as a remedy in fever; and, in certain conditions of fever, particularly in the gastric and contagious, it is a remedy of great value. My own experience of it is not extensive, or my observations on the subject precise; I do not therefore pretend to speak positively on the subject.

Muriatic  
Acid.

The *Powder of Charcoal* has lately been noticed as a remedy for the cure of intermittent fever. It may be ranked in this class of remedies, and it holds a distinguished place among them. I obtained information in the year 1813 from Dr. Borland, Inspector of hospitals for the Mediterranean station, of the effects ascribed to charcoal for the cure of intermittents; but, as I was not informed of the quantity to which it might be given with safety, or without inconvenience, I thought it right to ascertain the point by experiment in my own person. Accordingly I mixed a tea-spoonful of the powder—about twenty grains in a glass of pure

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Forms.

water, and I observed, in swallowing it, that a soothing sensation diffused itself around as soon as it reached the stomach. Convinced by this experiment that the powder of charcoal, as taken by the mouth, was safe and not disagreeable; and, reflecting on the changes which it produces upon ill conditioned ulcers, as well as on the effect which it is commonly known to possess of restoring spoiled meat to sweetness, I resolved to make trial of it in dysenteric fever, which was the most prevailing disease in the military hospitals in the island of Barbados at the time. The first experiment was made upon a soldier of the Royal Artillery, an athletic man. The symptoms were violent; blood had been abstracted from the arm to considerable extent; and calomel and opium—the more common routine, were then under exhibition. The disease still went on; the evacuations were frequent and small—mucons with mixture of blood; the tenesmus was so intolerable that the patient could not remain ten minutes in bed at a time; the distress was in fact great. Twenty grains of powdered charcoal were now given in a glass of rice water by the mouth, and one drachm, mixed in a gill of the same water, was thrown up by clyster. The relief was instant and perfect. I returned at an interval of two hours with a view to satisfy myself of the result. The patient was then free from pain, tenesmus or other unpleasant symptom:—the relief was ascribed by him to the clyster. From the good effect of the powder of charcoal, as given in the case stated, I thought it my



duty to recommend a trial of it in other similar cases which were then in hospital. The effects were similar; and, from these trials, the virtues of charcoal seemed to myself to be so well established in certain conditions of the dysenteric form of fever, that I communicated the information to the principal medical officers of the different stations within the command, requesting at the same time that trial might be made of it, and the results reported at the office of Inspector of hospitals at Barbados. The reports, which were transmitted from the different stations, were generally favourable; but they were not so uniformly favourable as I had expected they would have been,—a difference in part explained by the following fact. There were rarely any other than recent cases of dysenteric fever at Barbados; in the islands, there were many of long standing and of complicated form;—in these charcoal did not appear to be uniformly beneficial.

1. Where the dysenteric form of fever is recent, and where the mode of action is simple, that is, chiefly manifested on the secretions of the mucous membrane of the first passages, the powder of charcoal given by the mouth, or administered by clyster where tenesmus is urgent, affords immediate and effectual relief. The excess of evacuation is not only restrained by it, but the matter of stool is generally changed, viz. from blood and mucus, putrid and offensive, to figured feculence. With proper attention to circumstances of management, the health is usually re-established in the course of two or three days.

Rule of Administration.

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If the action of the disease be principally manifested in the lower part of the canal, as indicated by urgent tenesmus, &c. the powder is to be mixed with rice water or thin arrow root, in the proportion of a drachm to a gill, and injected by clyster: if the distress and uneasiness be more equal throughout the whole tract of the intestines, the charcoal is to be given by the mouth, to the quantity of twenty grains, in a glass of rice water—sometimes with the addition of six or eight grains of rhubarb and three or four of ipecacuanha. It is to be repeated at intervals of four hours; and I may add that, so repeated, it rarely fails of giving immediate ease, even of effecting, as observed above, a permanent cure within three days\*. 2. If the disease be complicated, that is, if the peritoneal coat of the intestines, or any of the more distant organs within the abdominal cavity sustain a material part of the morbid action, the exhibition of the powder of charcoal, whether given by the mouth or by clyster, has no more than a partial effect, if it have any effect at all. In this case, the complicated condition is to be simplified by

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\* A man, aged sixty, of the poorer class of inhabitants of Stockton-upon-Tees, had been six or seven days ill of dysentery—the stools bloody, mucous, and frequent—the tenesmus constant and intolerable,—he sat almost always on a chamber-pot. A drachm of charcoal was given by clyster—and, by mistake, some rhubarb, ipecacuanha and charcoal, ordered to be taken by the mouth, was added to it. The tenesmus ceased, and next day there was no dysenteric symptom.—He recovered without relapse.

bleeding, bathing, blistering or other means suited to circumstances. When that is done, charcoal resumes its place as a remedy for what may more properly be termed dysentery,—that is, diseased secretion from the interior coats of the intestine. 3. Where the dysenteric disease has been of long standing, the evacuations thin and watery, the tongue red and dry, smooth and glossy—with an erysipelatous blush throughout, the benefits of charcoal, whether given by the mouth or by clyster, are very insignificant. I have no just grounds to say that charcoal is then hurtful; but I cannot say with confidence that it is useful. 4. Where the disease has been of long standing, and where the structure of the coats of the intestine has been materially changed by its continuance, the powder of charcoal is sometimes beneficial, sometimes of no value. For example, where there is ulceration in the rectum and lower parts of the colon, the stools being bloody, foul and putrid, the injection of the powder of charcoal by clyster never fails to give relief: it even sometimes effects such material change on the diseased surfaces as leads to a permanent cure. On the contrary, where the chief seat of the malady is in the superior part of the colon which the injection does not reach; or where there are grounds to believe that the structure of the intestine is much changed, and that the change extends to the mesenteric membranes, the benefits of the powder of charcoal, whether given by the mouth or by clyster, are so uncertain that no one can venture to estimate them. 5. Powder of

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charcoal, given by itself or with the addition of a few grains of powdered rhubarb, has appeared to myself to be a remedy well adapted to the bowel complaints of children, and even to the diarrheas of grown persons, more especially to such as occur in the autumnal season. The first dose generally gives relief; a second or third, for the most part, effects a complete change in the nature of the evacuations.—It is however to be borne in mind, that it is only where the disease is of a simple character, and where the action of it is chiefly manifested on the mucous secretion, that the result is so fortunate as it is here stated to be.

The powder of charcoal, as stated above, was employed in the Mediterranean as a substitute for bark in the cure of intermitting fever. Some trials were made with it, in this form of disease, in some of the islands of the Windward and Leeward island station; but the results were undecided, or rather not favourable. Where the form was pure and simple intermittent, no material benefit ensued; where the type was remittent, the form bilious or gastric, the symptoms dysenteric, the evacuations mucous, accompanied with anguish at stomach, nausea, flatulence, vomiting, &c. the good effects were signal: the distressing symptoms were not only removed, but the disease itself was arrested and often finally cured.

Stomach  
Complaints.

Besides the beneficial effects of the powder of charcoal in dysenteric and gastric fever, the power which charcoal possesses of rectifying the vitiated

secretions of the stomach, whether connected with acute disease or chronic malady, deserve to be noticed in this place. Vomiting is often a distressing symptom in the fevers of the West-Indies. Where the vomiting proceeds from actions which produce diseased secretion as the prominent effect, the powder of charcoal, either singly or given in conjunction with the effervescing draught, is singularly successful in restraining it, even in removing it. It is of no avail, where the vomiting and nausea are connected with such irritations in the sentient system, as indicate unknown disorganizing modes of action in the substance of the brain itself. It is eminently useful, either alone, or mixed with some grains of rhubarb, in diminishing or removing flatulencies, sicknesses, nausea, crudities and other unpleasant sensation at stomach; such for instance as are more or less connected with vitiation of the secretions.\*

The above remarks, on remedies, have extended far beyond the limit that I had in view, when it first occurred to me to allot a separate chapter to the consideration of their history and effects. I cannot pretend to say that I may not have dilated too much upon the subject. I am indeed sensible that I have not sufficiently compressed what I had to say on the

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\* Charcoal mixed with rhubarb in greater or smaller quantity, has appeared to myself, in late experience among the labouring poor, to be of singular efficacy in rectifying the vitiated secretions and indigestions from which that class frequently suffer.

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effects of remedies that I have myself endeavoured to bring to the notice of the public; but, be that as it may, the observations, made in this place, will serve to facilitate, and often to supersede the necessity of detail in another.—The first point, in undertaking the cure of fever or any other disease, consists in discriminating the condition of the disease precisely, that is, the actual state of the morbid action; the second, and it is not less essential, consists in ascertaining to what extent the means, termed remedies, are capable of acting on the habit so as to change the base of the diseased condition, and to open the chances for the renewal of that which is healthy. The cure of disease rarely consists in a simple process of one operation. One remedy carries it to one point only; another, perhaps two, or more may be necessary to carry it to the actual point of health: hence the end is only attained through a series of successions; and hence the propriety of considering the power of remedies separately, or as acting on their own bases.

## CHAPTER VII.

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*General Plan of Cure, where the Febrile Action  
is manifested on a general Base.*

**I**T is not possible, in defect of sick returns that are digested with a view to scientific information, to estimate with precision the merits of the different modes of treatment that have been resorted to, at the same or at different times, by different practitioners for the cure of acute diseases. The materials which are before the public do not warrant a confident conclusion, whether Paracelsus, Van Helmont and Sylvius de la Boe on one part; or Galen, Botalli and Sydenham on the other were the most successful practitioners. They severally claim a success beyond that of their predecessors; and, as the author of a practice may be supposed to act under the guidance of a principle, it is reasonable to conclude that, as he acts with discretion, he acts with more effect than his follower who, not viewing the subject with his own eye, acts in routine on the authority of mere recorded precedent.—From the best informa-

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tion that can be obtained, respecting the history of febrile diseases and their relative mortalities in British fleets and armies during the last sixty years, the fact, whether the medical art is progressive, retrograde, or stationary, stands on very questionable ground. The sick of the military did not die in greater numbers in the hospitals which were established in Germany and Holland in the wars 1742 and 1756, than they did in the war 1793, —94 and —95; or than they did in the war 1803, viz. on the island of Walcheren in the year 1809. Further, there are no just grounds to conclude that mortality was greater, *cæteris paribus*, in North-America in the war 1756, than it was in the revolutionary war of 1775, or in the late war of 1813. Mortality has always been great among European troops in the West-Indies, especially among those newly arrived, or contingently exposed to field service; and it has been nearly equal at all times, viz. in the war 1756, in the war 1778, the war 1793, and the war 1803. The proportional mortality is low at present; but the decrease is only of recent date, and it would not be safe to pronounce positively, whether it is owing to improvement in medical management—with improvement in military economy; or to contingent and temporary change, in the nature of morbid causes, producing a less aggravated form of disease than belonged to other times.

The limit, assigned to the present work, does not permit me to enter into a detail of the principles which have been adopted, and the practices which



have been followed by preceding writers for the treatment of febrile diseases; the reader will therefore, I trust, be satisfied with a statement of what belongs to myself, as the result of my own observation. This being assumed, and supposed to be granted, I proceed to state, as a preliminary position, that my curative view in fever is of two characters, viz. absolute and decisive; or auxiliary and temporizing only. The first proceeds on a presumed knowledge, if not of the nature of the morbid cause, at least of its primary action; consequently the medical act, as decisive of effect, must be necessarily supposed to be directed to the subversion of the base of the perverted action, and to the re-establishment of that which is natural and constitutional;—in other words, to the effecting of a cure by force. The purpose is attained, or it is attempted to be attained through abstraction at one time, through addition at another, viz. depletion and stimulation—singly or combined. Alternation and combination of mode is important to success; but scientific combination of opposite modes in the same case is rarely adopted. The advocate of depletion adheres to depletion; the advocate of stimulation trusts in stimulation at all times and in all circumstances. Where this is the case, little knowledge is gained by experience; for things are seen only through the medium of pre-conceived opinion. The second mode, that is, the auxiliary, ventures no farther than to act on symptoms. It admits of means which diminish dangers; but it leaves the

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disease to pursue its course according to the law of its constitution, either to terminate by critical perspiration, local deposition or other less obvious mode of crisis. The auxiliary rule is imperfect ; it is notwithstanding the more usual rule of practice, inasmuch as it best coincides with the prejudices of the patient and the interest of the professors of the medical art.

Having stated the base of the principle on which I act, I shall endeavour to detail concisely, and as clearly as I can, the rule of practice through which application is made to the various forms of acute disease as they occur in every country ; but, more particularly, as they occur among British soldiers in the West-Indies, where they usually present themselves under forms of great concentration. The plan of treatment is different from that commonly adopted, not so much in the remedies employed as in the principle which directs the application. I consider fever, as already observed, to consist in changed organic action—not always changed after one manner, but always changed from the order of health ; hence to institute a plan of cure in consistence with the theory, I am led to arrest the course of the disease by strong measures, wherever such arrest is practicable and safe ; and, when the arrest is effected, I am further led to solicit, by suitable stimulation, a train of action analogous with the action of health, endeavouring thereby, if one may so speak, to assure recovery by force. According to this view of the case, nothing is left to nature. Disease is an

enemy in all its presentations. It is not to be merely repulsed from the citadel; it is to be attacked promptly, and totally destroyed, if we may use the figure, while it is making its investment. This, I conclude, will be the object with the provident physician. It is a practicable and safe object in most cases of recent fever of the progressive form. It is not always certain, and it even may not always be safe where the disease is advanced in its course, either where the structure of important organs is already violated, or where the febrile process has nearly attained a period of critical termination;—it is not safe, without modification, in the retrograde at any time.

The system of practice, which I have adopted myself, and which I now recommend to others for consideration, comprehends a combination of means which, on the first view of the case, may be deemed to be inconsistent with one another, but which an intimate view of the subject proves to be analogous, at least to conspire to one purpose and to bear upon one ultimate point in the effect. The means to which I allude are abstractions and additions, or depletion and stimulation alternated. It is on the properly adjusted and well-timed management of alternated depletion and stimulation, that the disruption of the febrile chain of febrile action, and consequent restoration of action to its customary and healthy movement evidently depend. Knowledge to form judgment of the necessity, and to adjust the measure of the means, viz. depletion and stimu-

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lation in their places, constitutes the physician sovereign in his office in so far as respects the cure of recent fever. It establishes him on the field of action with all his engines in force, and with little risk of erring in the rule of applying them. It is different where he meets the disease at an advanced period, or in the later stages of its course. Depletion and stimulation to a great extent are not then always practicable or safe. The boldest, and the most skilful must, in such case, be satisfied to act on secondary ground, that is, to avert imminent dangers, to repair local injuries, and to leave the result to the critical operation of nature, which is favourable or otherwise according to circumstances.

But on whatever ground the physician may act, primary or secondary, it is imperious and indispensable to success that he keep the precise history and condition of the patient always in view; that he personally attend to the exhibition of remedies, and that he judge the result of the application of the more powerful ones, viz. bleeding and bathing, by direct ocular inspection. The base of the practical view, viz. the subversion of diseased action is one throughout; but the conditions of the subject are so varied that the precise result cannot be anticipated from the effect of a general prescription; therefore the physician cannot, in conscience, take his eye from his patient, until he have evidence that he has conducted him into a right course.—In accompanying the author of the present sketch through the detail of cure here given, the reader is requested

to estimate, with care and precision, 1. the temperament of the individual subject—whether sanguine, lymphous, serous, or gangrenous; 2. the form of the disease, whether acting equally throughout, or more especially prominent in one organ, or in a series of parts; 3. the act, whether progressive or retrograde; 4. the relative force, and rate of progression, whether to a favourable or fatal termination.

### A. SECTION I.

#### *General Plan of Cure, where the Disease acts on the Sanguine Base of Temperament.*

1. The simple and mild form of continued fever, the action of which is manifested on the sanguine temperament, and the history of which is given at page 60, usually terminates finally, or changes form at a given period, most commonly on or before the seventh day, and generally on an odd day, viz. one of the reputed days of crisis. The termination is rarely fatal, though nothing of consequence be done in counteraction of the tendency which the febrile action has assumed; but, as it is not prudent to leave the cure of a disease to chance or nature, while there are grounds to believe that it may be speedily and safely cured by art, it is proper, the patient being laid in a recumbent posture, that blood be drawn from the arm to the extent of one or two pounds, or more as the case may be, the operation being so conducted, in its ma-

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Mode of  
Cure.

nagement, that arrest, or subversion of the diseased action be thereby assured. This is usually indicated by relaxation of the skin, abatement of headache and other pains, reduction of the velocity, force, and tension in the pulses of the arteries, even sometimes by actual fainting. When the course of the disease has been broken by the means stated, the affusion of cold water on the head and shoulders from a bucket, or by means of a sponge, according to the circumstances of the patient and the temperature of the water, rarely fails to extinguish every remains of disease, even to excite a form of action analogous with the action of health,—in other words, to assure recovery.—The cure of simple fever of the mild degree is generally effected by the means stated, if they be applied with force and with discernment of condition; but, in order to render the act sure, or to preclude chances of recurrence, it is at the same time advisable to apply a blister to the nape of the neck extended to the interval between the shoulders, also to the temples, if there be pain in the head, or if the pain of the head had been severe previously to the bleeding and bathing. If the tongue be foul, or if it be covered with tough slime, the operation of an emetic is useful, and, in such case, fifty or sixty grains of kali dissolved in a pint of tea or other liquid may be exhibited with advantage, prior to the exhibition. Most British practitioners give purgatives or laxatives of some kind or other in the early stages of fever. If the course of the disease be broken by the means pre-

viously employed, the practice, while safe, conduces to render the cure, in some degree, secure; and, of the forms employed for the purpose, an infusion of senna, with a portion of tartarized soda, and a greater or less proportion of antimonial wine, or acetated water of ammonia, may be considered as one of the best—effective and extensive in its operation as thus compounded and given in divided doses.—It rarely happens that any thing further is necessary in the way of medicine; and it may be presumed that, with occasional ablution of the whole body with cold water, frequent changes of linen, gestation in the open air of more or less duration, a form of diet, low in measure, but prepared with care, and suitable in kind to the existing condition, the patient will be enabled to return to his duty, or ordinary occupation in seven or eight days at farthest in the full vigour of health.

The above means of cure are generally decisive when employed at the commencement. But, if the disease has been of two or three days standing before it has been brought under the eye of the physician, though the same course of proceeding is still to be adopted, the means are to be adjusted with more circumspection; and, notwithstanding all the care with which they are capable of being adjusted, they do not give the same promise of certainty to the effect. It may now appear necessary to abstract blood; but the quantity cannot be defined by prescription. It must be regulated by circumstances which arise in the course of the operation, viz. re-

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mission from pain and comparative freedom in the ordinary offices of secretion and excretion.—When the point in view is gained, bathing—warm and cold bathing alternated, is often decisive of cure. If the force of the disease be broken, or its course arrested by the means employed, the application of blisters to the nape of the neck, extended to the interval between the shoulders, aided by small, and often repeated doses of calomel and James' powder, Dover's powder, or aq. ammon. acet. are useful in preventing recurrence:—if recurrence be prevented, health, I may add, is for the most part re-established before the expiration of the first seven days. If the disease has attained the fifth day, or if it be even more advanced before it is submitted to medical treatment, bleeding, purgatives of severe operation, or other remedies which make strong impression, and thereby occasion sudden subversions, are not advisable:—they are superfluous if the movements of the disease proceed regularly toward crisis. Little in that case is required to be done, and more cannot be done with propriety than to facilitate the existing movement by fomentation of the extremities with flannels wrung out of hot water, by mild internal diaphoretics, viz. James' powder or other antimonial, the admission of pure air into the apartment, suitable drinks and cordials, according to the circumstance. On the contrary, if the symptoms, even at this advanced period, threaten danger to life, that is, violence to the structure of important internal organs, the dangers are to be obviated by



decisive treatment, viz. bleeding to extent—without regard to expectations from the effect of impending crisis.

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The simple and mild fever, as left to its own course, frequently terminates favourably and finally on the seventh day or earlier; it also sometimes continues to fluctuate under different changes of form for weeks, even for a month or more after its first formation. But, besides fluctuations under the same radical character, it also, on many occasions, changes about the fifth or seventh, assuming at such period a new course and new base of action. In this manner, it changes from progressive to retrograde, still continuing on the sanguine or humoural base; or, from sanguine and humoural, it moves to another series of parts, viz. the sentient, where its action appears greatly varied.—Gestation in the open air in spring carriages or other vehicle, frequent ablutions with sea water, or water in which a quantity of salt has been dissolved, frictions of the body with rum or brandy, vinegar and salt, or salt and lime juice, are among the external means; peruvian bark, muriatic acid, wine, cyder, bottled porter, &c. in various proportions, changed and combined as circumstances suggest, are the principal of the internal, employed in simple fever when it assumes the retrograde course. In the other case, viz. where the morbid action is transferred to, and almost, in an exclusive manner, manifested upon the sentient system, whether manifested in the intellectual function by mental alienation, or in the

Late Stage,  
or, Retro-  
grade.

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external locomotive by excessive mobility, viz. tremors and faintings, or excessive irritation, starting, spasm, and convulsion, the means most available in moderating or removing the suffering, where a mode of general febrile action only unconnected with organic congestion, appear to myself to rest on opium, singly, or in combination with others, viz. antimonials, blisters, warm bathing, or fomentations with flannels wrung out of hot water. The means stated are those upon which the physician depends; but the rule for applying them is not always a clear and an easy one. If the trust be placed in opium as the chief remedy, it must be considered as preliminary that its operation be facilitated by removing, in so far as possible, every contingent impediment that lies in the way, or that may be supposed to lie in the way of its free action. This is done by the judicious employment of antimonials, of blisters, of bathing, and of fomentations. It is observed that opium sometimes suppresses delirious wanderings of the minor degree, sometimes moderates furious excesses, sometimes obviates excessive irritability manifested by startings, spasms and convulsions, sometimes blunts excessive mobility manifested by tremors, faintings, &c. and sometimes gives confidence and firmness to the mind from the agonies of fear and despondence. As the ostensible effect in these different modes of operation is apparently opposite, it cannot be otherwise explained than, by supposing that opium possesses a power of absorbing (if one may use the expression) the

febrile action in the action that is peculiar to itself. It is from the peculiar action of opium that the action of the disease is supposed to be superseded in this case; but, while the fact is admitted, it is necessary to be observed that auxiliary means are often required to assure success to the effect. Opium fails alone: it succeeds in combination; but it only succeeds where the morbid act fluctuates as a temporary transfer to the sentient system generally, not where the act is complicated with, or dependent upon local injury of the primary organ of sense and intellect.—Besides opium, the spider's web has often been given by myself, in conditions similar to those noticed above, with singular benefit; I am warranted to say with more decisive benefit, singly and uncombined, than is ordinarily obtained from the other with all the extra aids that can be contrived to promote its operation.

Where periodic fever of the minor degree of violence exists under the predominance of the sanguine temperament, the rule of treatment is simple, and the effect for the most part is calculable—I have nothing to add on the subject of the regular intermittent beyond what is commonly known; and I only observe of the remittent that the Peruvian bark, after a proper preparation of the subject, is to be given in doses of forty grains, or one drachm, every third hour during the remission. The quantity of forty grains, given every third hour, is sufficient to prevent the untoward occurrences that happen not unfrequently about the sixth or eighth

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day where these means are neglected. No quantity is sufficient to arrest the remittent in the midst of its course; for it ordinarily, in so far as my own experience goes, proceeds, in the direction it seemed to have received from the original impression, to termination and crisis at a critical period in spite of the opposing powers of bark, however largely and regularly administered.

Concentrated.

2. The first step, towards a cure of the ardent or concentrated fever, described at *page 65*, if the disease be submitted to the care of the physician within twelve hours after the attack, consists in subtracting blood from the arm by the largest possible orifice, and in subtracting it in quantity sufficient, whatever be the number of the pounds, to produce relaxation of the surface and other organs of secretion; thereby effecting a change in the pulse, remission from pain, ease and freedom in the exercise of all the functions, in short, a total subversion of the base of the diseased action. A quantity less than three pounds is rarely sufficient to produce the effect; six have not been more than sufficient on some occasions. The quantity is high; but, whatever the quantity may be, let the practitioner bear in mind that he does little or nothing in the case if he stop short of the quantity which produces a decided change. Where head-ache is particularly intense; and moreover where the pain darts through the head with throbbing at the temples, the eyes hot and inflamed, accompanied with marks of excited action in the exterior mem-

brane of the brain, the temporal artery is to be opened in preference to a vein in the arm. In such case, the quantity of two pounds of arterial blood, from the temples, has often more effect than four drawn slowly from a vein in the arm. When the course of the disease has been changed, or arrested by subtraction of blood, whether from the temporal artery or from a vein, the patient is to be placed in a warm bath of a temperature agreeable to the feeling, viz. from 92 to 96 of Fahrenheit's thermometer. The head is to be raised somewhat high, the limbs and body entirely covered by the water, the body rubbed with soap and scrubbed with brushes, until all impurities be removed from the skin, and the whole surface be animated by the scrubbing and infused warmth. The benefits of the bath, if the view go farther than personal purification, cannot be obtained in less than half an hour. It will moreover be advisable that the head, at least the fore part of the head and temples be shaved while the body is immersed in the bath; and, if pains or uneasinesses of any kind remain, after the discipline here enjoined has been submitted to, it is recommended that the bandage be removed from the arm, and that the blood be allowed to flow under the eye, and even under the touch of the physician, until the object in view be attained. When the course of the disease has been broken or arrested by the means stated, no signs of local congestion or internal disorder being cognizable on the most careful examination, the body is to be raised

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up, placed upon a stool within the bath, cold water poured upon the head and shoulders, gradually and sparingly by means of a sponge, or suddenly and profusely from a bucket or large vessel, as judged most suitable to the circumstances of the case. When these operations are finished, the patient is to be laid upon a couch, wiped dry and clothed according to rule, viz. shirt, night-cap and gown, and conveyed to the allotted ward. As soon as he is properly disposed in bed, one blister is to be applied to the forehead and temples, another to the nape of the neck extending down the spine to the interval between the shoulders; and, in case of nausea and disagreeable sensation at stomach, it is further recommended that one be applied to the pit of the stomach:—the parts, to which the blisters are applied, are to be rubbed with hot Cayenne vinegar, or spirits, previously to the application.

The process I have now stated constitutes the ground work of the cure. I consider the ground work to be secure; but, though secure, it will not be sufficient without superstructure. Purgatives of one form or other constitute a material part of the ulterior means. Jalap and calomel, with a few grains of James' powder, made into pills for the convenience of administration, answer as well as any one that can be contrived. Dilution with tea, whey, or other agreeable beverage contributes to render the purgative operation effective; the addition of more or less of the acetated water of ammonia facilitates its action, and renders the effect more

extensive than it otherwise would be. If there be irritability at stomach, with erysipelatous appearances at the fauces, camphorated mixture with zinc, nitre and alum, even dilute solution of sugar of lead swallowed gradually has, according to my own observation, often diminished the irritability, apparently checked the erysipelatous progress, contributed materially to the comfort,—and presumptively assured the safety of the patient's life.

The cure of the more concentrated of the fevers of the West-Indies, even of that form which, left to its own course or feebly opposed by art, terminates by jaundiced yellowness and black vomiting within the fifth day, has appeared to myself to be a matter of almost calculable certainty, where the means here recommended have been applied to sufficient extent, applied in time, and in their proper places. After twelve hours have elapsed, that is, after the first paroxysm, or tumult of invasion has subsided, the result is less certain; for it happens not unfrequently that the tumultuous action, of even the first paroxysm, commits such violence on the structure of internal organs as renders the effect of remedies at a future period void, or imperfect. I therefore speak with less confidence of the power of remedies in the period, which follows the decline of the first tumults, to the beginning of the third day, when the case is usually decided, either favourably or fatally. If the patient be submitted to medical care in this interval, (the symptoms as described at *page 71*,) it is recommended that he be placed in a

In the Pro-  
gressive.

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tub of warm water of a temperature agreeable to the feeling, that the head be raised high, that the forehead of the head and temples be shaved, that the body be immersed to the chin, that the limbs be rubbed with soap and scrubbed with brushes, and that the abdomen and sides be pressed and agitated during the rubbing. When impression has been made by this form of discipline, the sensibility of the surface being thereby increased, and the sluggish or oppressed venous circulation being more or less animated, a vein is to be opened in the arm, the effect produced by the flow of blood carefully watched with a view to farther proceeding. If the blood flow freely; and if the pulse, from sluggish and concentrated, become quick, frequent and expanded, a favourable result may be anticipated, either from the direct effect of the remedy, or from the condition which it induces preparative of the effect of other remedies. It is not safe, in this case, to define quantity from preconceived opinion; but I may venture to say that it will not be advisable to go beyond two pounds at the first trial. The object is not to attempt to arrest the course of the disease abruptly by strong measures—for in that there may be danger; it is rather to move and agitate, to advance step by step, until a position be gained, from which a bold proceeding may be assumed without fear of doing harm. Impressed with this idea, I generally recommend that, after blood has been abstracted to the quantity specified, the patient be allowed to remain in the bath for fifteen or twenty minutes, that the limbs be



again rubbed with soap and brushes,—and that the abdomen and sides be pressed and agitated by pressure, with a view to discover cause of impediment, or to move action. If the patient be languid or disposed to faint, wine or other cordial may be given with safety, and must in fact be given as a remedy. After the languor is removed, the vein is to be re-opened if the actual state of things justify the proceeding, that is, if the relief be not perfect. When the vein is re-opened, the blood is to be allowed to flow under the eye of the physician to the greatest warrantable extent. A change of circumstances is the object in view, viz. a removal of internal congestion in consequence of which the natural susceptibility re-appears. When that is attained, the patient is to be raised up, placed upon a stool within the bathing tub, the head and shoulders affused with cold water as he sits upon the stool—copiously or sparingly as may be most suitable to circumstances. When the whole of the processes connected with bleeding and bathing are finished, the skin is to be wiped dry, rubbed with hot flannels, afterwards with warm olive oil, or other more stimulating liniment, the temples, nape of the neck and pit of the stomach covered with strong blisters. Infusion of senna, with a portion of kali, æther and acetated water of ammonia, is to be given at intervals as a purgative. If the bowels be torpid and the stomach squeamish, purging tincture of aloes and myrrh, with the addition of an ounce or more of rectified oil of turpentine, is preferable. With

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the addition of turpentine, the tincture of aloes operates speedily and efficiently, and it is less liable to be rejected than less nauseous drugs. Sage tea, saffron tea or snake-root tea with acetated water of ammonia are recommended to be given freely during the operation of the purgative. They aid in extending the purgative effect and in rendering the benefit more permanent.—If relief has not been obtained from the proceeding stated, executed in all its extent under the eye of the physician himself, gestation in a spring carriage in the open air, refreshing drinks and cordials, and frictions of various kinds are next to be tried: they may do something—save or prolong life; but it is not expected that they will speedily and abruptly cut short the course of the disease:—recovery, if it do take place, will be slow and liable to accident.

The various processes, here detailed, are to be executed under the eye of the person who has the responsible charge of the patient's life; for, as the success of the effect depends upon the just application of the means to the end; and, as that comprehends a series of successions and alternations somewhat complicated in appearance, the end cannot be attained, or it will be only attained through chance, unless the principle be fully understood by the prescriber, and applied in all the steps of the operation under his immediate direction. Such is the importance of time and circumstance, in cases like the present, that the same general means, which succeed with one physician, frequently fail with ano-

ther, in as much as the one either does not conceive aright the principle on which means act, or does not take the trouble to attend minutely to time and circumstance in the manner of applying them. If the physician be desirous to save the life of a patient from the perilous state of disease here described, he cannot expect to put all his engines in a fair train of operation for accomplishing the purpose, in less than two hours of close attention to administration. This is a sacrifice which few make, for they do not sufficiently estimate its importance; but, if they do not make it, they must not be disappointed if they fail in doing what they promise.

The fate of the patient is generally visible in the early part of the third day, where the disease is concentrated and left to its own course. I shall therefore now consider it as it usually is on the fourth, such as it is stated to be in the description at *page 70*. The hopes of cure, I must confess, are then small: the following are the means through which a cure is to be attempted. The patient is to be immersed in a warm bath of rather high temperature, with the addition of a certain portion of *ammonia*, or *eau de Cologne*. After fifteen minutes of immersion, under friction of the extremities and particularly of the abdominal section of the body, a vein is to be opened in the arm, and blood abstracted in quantity not exceeding ten or twelve ounces. When the arm is bound up, a cordial draught of some kind or other is to be given immediately, viz. soda water, brisk bottled porter, or a glass of genuine cham-

Retrograde.

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paigne wine, if it can be procured. The limbs and abdomen are to be strongly rubbed while the body is immersed in the bath:—the heat of the bath ought to be at least 98, its effect augmented by the addition noticed above. Cordials, such as are most agreeable to the taste, are to be given at intervals: the vein is to be re-opened, the appearance of the blood, and the mode after which it flows from the vein carefully observed. The changes which occur in the appearances of the blood, while it flows from the vein, indicate change in the condition of vitality; the observation of that change is the safest guide for the direction of future proceeding. The good effects of purgatives are considerable at the present stage of the disease; and of purgatives, the purging tincture of aloes and myrrh, with the addition of rectified oil of turpentine, has appeared to myself to be the best, particularly as given after calomel. Camphorated mixture, with a proportion of zinc and alum; and, on other occasions, dilute solution of sugar of lead, viz. ten grains of sugar of lead, two drachms of chrystals of tartar dissolved in a quart of boiling water, and given by wine glassfuls at a time, every two hours or oftener, frequently restrains vomiting; and, if it do not prevent, at least retards the progress of disorganization. Soda water, brisk bottled porter, brandy and even spirits of wine undiluted, &c. have been employed to allay vomiting; and they have been employed by myself with benefit in some very untoward cases of disease.—The state of the malady, now under consideration, is a forlorn one, generally indeed

a totally hopeless one. It would be arrogant presumption to say that it is remediable, at least to say that the effect of remedies can be calculated with reasonable certainty. But though not certain, I have grounds to say that a combination and succession of remedies,—stimulant or abstractive, assisted by gestation in spring carriages in the open air, have forcibly maintained life for a time, and even, on some occasions, finally rescued the patient from the grave; but the case is so doubtful, I would not venture to promise success; I only recommend trial.

The above is an outline of the mode of proceeding, which I recommend for the cure of the continued fevers of the sanguine temperament as they differ in degree, stage, and condition. It will be expected that I notice the periodic; and, as the treatment relates chiefly to simplification—that is preparation for the known specific, a few remarks will suffice. In the violent, but radically periodic fever, abstraction of blood from a large orifice, and in large quantity, precedes all other remedies,—not only as preventative of dangers by its own power, but as preparative of the successful action of those means which are held to be sovereign in the cure of the disease itself. The abstraction, alluded to, is to be made with all the known provisions which contribute to assure effect from the act.—When internal congestion, and violently excited action have been removed by bleeding, the general habit is rendered susceptible of impression, and the emetic, in such

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case, becomes a remedy of value. It is next in order of time to bleeding. Of the substances by which the emetic operation is excited, the preference is due to the antimonial, where the subject has been suitably prepared for its operation. Where the circumstances, stated to be necessary in the preceding pages of this work, have been duly attended to in the administration, the effect is often decisive of good:—it restores balance, or moves secretion. After the operation of the emetic, it is advisable to give a purgative of one kind or other. Jalap with calomel is one of the most efficient: its effect is rendered more extensive, and its operation is rendered less unpleasant by the addition of James' powder, or a certain portion of acetated water of ammonia. A blister applied to the nape of the neck and extended to the interval between the shoulders, affords an additional security against recurrences of danger; and, besides being a security against the recurrences of danger, it often removes causes which cannot be ascertained, but which, in some inexplicable way, now and then, oppose the operation of bark in preventing the return of paroxysms.

When the intermittent has been brought to order and regularity, congestions removed and general susceptibility to ordinary impression restored by these and other suitable means of remedy, an ounce and a half, or two ounces of genuine bark, given in doses of two drachms at an interval of two hours between each dose, rarely fails to prevent the recurrence of the paroxysms; and, with due attention to

diet and regimen, it often succeeds in curing the disease permanently. The virtues of the bark are improved, that is, the effect is more certain, the cure more perfect, if twenty or thirty grains of the muriate of ammonia be added to each alternate dose. —With suitable preparation of subject, I consider bark as sovereign for the cure of fevers of the inter-mittent type. It conduces to safety in the remittent; but it does not arrest progress abruptly. The spider's web is of more dependence for the cure of intermittents than bark, and it has virtues to which bark does not pretend. It may be given in a great latitude of condition and with much certainty of effect, not only as preventative of the return of the paroxysm, but as suppressive of its course at all its stages.

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The following cases are selected from a great number now in possession of the author. They are selected, with a view to give the reader some idea of what was actually done by different regimental surgeons for the cure of this disease. They are chiefly cases of the concentrated force, such as left to themselves might have been expected to terminate fatally—and to terminate with black vomiting.

## CASE I.

St. Christopher, *April 23th*, 1812.—Sergeant Halley, 25th regiment, aged 28, of a full habit, active and athletic, attacked at six in the evening with giddiness, violent pain of the head accompanied with delirium; the pulse 136,—full and strong; the skin dry; heat 103,—pungent; tongue slightly furred; pains in the back and limbs severe. Bled to the extent of 46 ounces; tepid bath; head shaved and blistered; purgative bo-

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lus. 29th,—pulse 88,—expansile; heat 96,—equally diffused; gentle perspiration; tongue moist and clean. Calomel and James' powder: aq. ammon. acetat. 30th,—pulse 76; skin soft and cool:—recovered rapidly.

## CASE II.

St. Christopher, *April 9th*, 1812.—Wilkinson, 25th regiment, aged 30, of a spare habit, attacked about eleven o'clock in the forenoon, brought to the hospital in the evening, complaining extremely of pain of the head. The face was flushed, the heat great, the skin dry, the pulse 100,—full and hard; pains in the loins and limbs severe; tongue foul. Bled to nearly sixty ounces; the pulse sunk to sixty in a minute, or rather under sixty, becoming, at the same time, regular and free. The head-ache was entirely removed; the heat and fever completely extinguished—without fainting or disposition to faint. A purging bolus was given immediately—its operation accelerated by an injection. 10th,—the skin cool and soft; the pulse 80,—full and expansive; the tongue clean; thirst insupportable. A blister was applied to the forehead and temples; aq. ammon. acetat. with calomel and James' powder in repeated doses. 11th,—pulse natural:—no remains of disease. 12th,—the mouth somewhat affected by mercury; no other complaint:—recovery rapid.

## CASE III.

St. Christopher, *April 24th*, 1812.—B——, an officer, attacked in the forenoon with the ordinary symptoms of fever; the head-ache violent—almost intolerable; the pulse strong and frequent. Bled to ten or twelve ounces,—not materially relieved. The symptoms very urgent in the evening; the vein again opened and between fifty and sixty ounces abstracted by a large orifice while he reclined on the couch. The blood was allowed to flow until the pain of the head was altogether removed; the pulse became open, free and expansile,—it still continued of febrile frequency. A purgative had been given soon after the



commencement of the indisposition and before the second abstraction of blood; the aq ammon. acetat. was now given at intervals. 25th,—sleep and copious perspiration during the night. 26th,—no fever:—recovery rapid.

## CASE IV.

St. Christopher, *March 29th*, 1812.—Blackburn, 25th regiment, aged 28, admitted into the hospital in the evening, complaining of the ordinary symptoms of fever which then prevailed in the garrison. A purging bolus was given immediately; and, sometime afterwards, calomel with James' powder and aq ammon. acetat. at intervals. 30th,—severe head-ache; severe pains every where, with a particular kind of catching in breathing; the pulse frequent and full; the tongue dry; the heat high; the sensations extremely distressing. Bled to the extent of 36 ounces,—became faint under the operation: copious evacuations both by vomit and stool—the purgative not having operated till now. The pains of the head and other parts ceased, and catching in breathing disappeared; the pulse nearly natural. 31st,—the pulse frequent and quick, but soft and free; the tongue foul,—a sense of fulness at stomach with impatience of pressure. Blister to the epigastrium; camphorated mixture with a small portion of zinc at intervals of four or five hours: calomel and James' powder continued. *April 1st*,—the mouth somewhat affected by mercury; the body open; the tongue still foul; the skin soft and open; the pulse regular,—quick,—soft. 2nd,—the mouth affected; diaphoresis considerable. 3rd,—considerable salivation:—recovered.

## CASE V.

Barbados, *November 11th*, 1813.—Watley, R. Artillery, of a robust form and full habit, attacked about three o'clock in the afternoon with giddiness, pain of the head, sickness and vomiting, and brought to the hospital before five. The pulse was hard and frequent; the skin hot, but moist. Bled to the extent

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of 20 ounces, somewhat relieved, not much: immersed in a warm bath, the vein re-opened, and two pounds and a half abstracted in addition, making in the whole near four pounds: cold water was affused upon the head and shoulders in quantity: the head-ache and uneasiness at stomach entirely removed. Calomel gr. x., and, at a short interval, a solution of Epsom salts; blister to the head. 12th,—sweated freely in the night: bowels freely opened. 13th,—no complaint. 18th,—discharged.

## CASE VI.

Barbados, *November 14th*, 1813.—Brown, R. Artillery, aged 24, stout, plethoric, indisposed for some days, admitted to-day complaining most severely of pain of the head, breast and stomach: the pulse hard and frequent; the skin hot and dry; thirst great; body costive; respiration hurried and difficult. Bled to the extent of five pounds. Ten grains of calomel, followed, at a short interval, by a solution of purging salts; blister to the breast. Fainting supervened after the subtraction of blood; the pains of the head and chest disappeared. 15th,—pulse nearly natural,—perspiration during the night; tongue white, but moist;—not much sleep. Calomel with rhubarb; blister to the head. 16th,—body open; no pains of any kind. 18th,—discharged.

## CASE VII.

Barbados, *October 27th*, 1813.—Gordon, R. Artillery, aged 27, attacked suddenly in the evening and brought to the hospital immediately, complaining of severe pain of the head—darting and almost unsupportable, accompanied with pain about the chest of a nature not easily understood. He soon became furiously delirious; the pulse strong,—hard and frequent; nausea with vomiting. Bled to the extent of five pounds; warm bath; calomel, followed by a solution of salts; blister to the head: relieved by the bleeding,—composed after the bathing. 28th,—pulse calm; skin cool; bowels not opened: castor oil,—sleep,—skin moist. Evening,—several stools. 29th,—feelings

of weakness; nausea: no fever: calomel and rhubarb. 30th,—better. November 3rd,—discharged.

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### CASE VIII.

Barbados, *September 29th*, 1814.—Nesbit, R. Artillery, attacked on the evening of the 28th with violent pain of the forehead and temples, shivering and other attendants of fever, and brought to the hospital in the morning under very aggravated symptoms of disease. The pulse was full, strong, and frequent; the face flushed and swollen; the eyes red and painful. Bled to the extent of four pounds; tepid bath followed by cold affusion. The bleeding not having removed, or even mitigated the severity of the pain of the head, the temporal artery was opened, and two pounds and a half of arterial blood were thereby obtained; instant relief was the consequence.—Blisters to the nape of the neck and to the head itself; a draught—tincture of opium and æther: calomel gr. v.; and, at a short interval, a solution of purging salts. Evening,—sickness and vomiting occasioned by the salts—body not open: castor oil—purging clyster. R. ceruss. acetat. gr. vi.; aq. ammon. acetat. oz i.; mist. camphorat. oz. ii. :—half an ounce every hour. 30th,—he threw up the castor oil—and vomited several times during the night: copious evacuations by stool: free from pain;—more or less of nausea. Castor oil repeated,—again rejected. R. Carbon. Ammon. gr. xii.; Magnes. alb. ser. i.; aq. puræ, oz. ii.; Succ. Lemon. oz.  $\frac{1}{2}$ . *October 1st*,—several evacuations by stool,—passed a good night: twenty grains of powder of charcoal three times a day. *2nd*,—the powder of charcoal repeated—with infusion of bark. *3rd*,—an emetic of emetic tartar and ipecacuanha. *4th*,—purging draught. *5th*,—discharged to duty in perfect health.

### CASE IX.

Barbados, *May 5th*, 1815.—D—n, R Artillery, attacked with fever of great apparent violence—head-ache, vertigo, &c.

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## B. SECTION II.

*General Plan of Cure, where the Action of the Disease is manifested on the Gangrenous Base of Temperament.*

I have stated, in some detail, the various means which I employed for the cure of the fever of the West-Indies, as it appears in subjects of the sanguine temperament under the progressive form of action. I shall now briefly, but as precisely as I can, consider the mode of treatment in the gangrenous retrograde ; a form of disease which, according to my own idea, is to be regarded as the counterpart of the sanguine progressive. The historical description of the gangrenous form is found at pages 86 and 89. The proper management of the plan, which I am desirous to institute for its cure, is difficult in itself ; and the admission of the principle by which it is to be directed will not, I am aware, be easily obtained from the generality of medical readers. My limits do not permit me to enter into long discussion ; I shall therefore simply state the fact of practice, and suggest the reason through which it was adopted,—not urged to do so by the desire of promulgating novelty, or deterred from doing it through fear of offending opinion.

The cause of fever, as applied to subjects with a gangrenous tendency in the habit, produces a disease of different degrees of force and intensity; but, as of one general character, open to be acted on by one general remedy. It is a fundamental rule in medical practice that the course of fever, whether the mode of action be progressive or retrograde, be arrested by one train of remedial means, and that action, analogous with the action of health, be solicited and moved into activity by another. This is a position which no one will contest. The difference of opinion, if a difference exist, must be sought for in the selection and application of the means made use of to effect the purpose.—When I venture to place abstraction of blood at the head of the list of the remedies to be employed for the cure of fever of the gangrenous character, I am not sanguine in the expectation of making proselytes to the doctrine: it is however right to say that I have so employed it, that the effect has been fortunate, and that the reasons, on which the success of the effect depends, appear to myself to be valid. But valid as they may be, I do not exact acquiescence in them, I shall therefore detail the steps of the proceeding with circumstance, and leave the reader to form conclusions on the subject from his own reflection. And first, if a patient, under the influence of febrile irritation in a gangrenous temperament, be brought to the hospital soon after the commencement of the disease, whether the action be of the higher or lower grade, he is ordered to be immer-

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sed in a warm bath of rather a high temperature, the body to be rubbed with soap and scrubbed with brushes, the head to be shaved, at least the forehead and temples, a vein to be opened in the arm while the body is under immersion, the blood allowed to flow, the changes which take place in the mode of flowing, and the change which takes place in the blood itself in the vessel into which it is collected, to be carefully observed for the direction of farther proceeding. In this form of disease, the blood flows reluctantly for the most part; and in many cases, it only flows as urged by friction and the artificial heat of the bath. It is likewise for the most part dark coloured, and, presumptively of a low temperature in point of heat. If the colour change from a darker to a brighter red, the stream, from a reluctant to a brisk and rapid current, there is evidence of a change in the circumstances of the case, and grounds to anticipate a fortunate one on the issue of the disease. Abstraction of blood is prescribed in the case stated,—the quantity to be abstracted cannot be defined by prescription;—it is in fact only from observation of effect, under the act of flowing, that we safely judge of it. It is proper that the orifice made in the arm be free; but it is not advisable that it be large, or that we endeavour to abstract in the shortest time possible;—on the contrary, it is proper to compress the orifice at intervals, so as to interrupt the flowing of the stream with a view to ascertain and estimate the effect of what has been done, or what is doing. The course

is a course of experiment. It is safe where conducted with circumspection: it may be dangerous where made at random, or without a view to contingencies in the act of progression. When the changes contemplated by abstraction of blood have been effected, the skin purified and animated by scrubbing and the heat of the bath, the patient is to be raised from the recumbent posture, placed upon a stool, and submitted to affusion of cold water upon the head and shoulders, either from a bucket or by means of a sponge. He is then to be laid upon a couch in a warm apartment, supplied with warm tea or other warm cordial liquor, wiped dry with linen towels, afterwards rubbed long and strongly with flannels heated at the fire; finally with hot and stimulating oils, covered with his hospital dress, and conveyed to the ward allotted for him.

The original tendency of the disease is supposed to be checked, the course of action is even supposed to be moved into another channel by the proceeding here described. The prevention of recurrence is generally assured by the impressions of a warm and well ventilated apartment, by frequent ablution with cold water, frictions of the skin with hot and stimulating liniments, cordial and stimulating drinks, and various medicines of the stimulating, antiseptic, tonic class, viz. snake root, camphire, ammonia, yeast, nitric acid, muriatic acid, fruits, peruvian bark; and, above all, by gestation, and such other exercise in the open air as the strength of the patient can conveniently bear.

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If the disease hath been of some days standing before it has been submitted to treatment; and particularly if, together with the general gangrenous diathesis, there exist accumulations or congestions of blood in the substance of the spongy organs, viz. lungs, liver or spleen, the application of remedy is still to be directed by the same principle, but the adjustment of means to the condition is difficult, and the effect little certain. The abstraction of blood is of principal dependence, but it is not always of direct application: unless it be preceded by a suitable preparation of subject, it is not applied with effect, not even with safety. The preparation alluded to consists in the application of external heat to the surface by the warmth of the apartment, by the temperature of a bath raised to 96 or upwards,—the impression of the heat moreover augmented by the addition of water of ammonia, *eau de Cologne*, or other material of that class. When the patient has been immersed in the bath for fifteen or twenty minutes, the body having been rubbed by the hand or scrubbed with brushes during the immersion, a vein being opened in the arm, the change, which the blood assumes in the act of flowing, is to be carefully observed with a view to obtain information for the direction of the future course. If the patient become faint before there be evidence that the end in view is attained, the orifice is to be closed, a cordial draught administered, the face and breast sprinkled with cold water, with vinegar and water, or aromatic spirits. After some minutes of repose, and



after the signs of recovery are sufficiently manifest, the vein is to be re-opened, and the blood allowed to flow, even urged to flow by external frictions and internal cordials until internal congestions be removed, general susceptibility restored, and circulation equally balanced throughout the system. As soon as this is effected, the patient is to be raised from the recumbent posture, placed upon a stool within the bath and submitted to the affusion of cold water—sea water, or water impregnated with salt. The body, removed from the bathing tub, is to be laid upon a couch, wiped dry, and afterwards rubbed with flannels heated at the fire to as great extent as can be endured without pain, a warm and grateful internal cordial being given at the same time with a view to augment effect. When the dry rubbing is finished, the whole body is to be rubbed with camphorated liniment, rendered pungent by oil of turpentine or ammonia; or it is to be washed preferably with *eau de Cologne*.

What has been stated constitutes the sum of treatment recommended in the later stages of fevers of the gangrenous temperament. If applied under a right conception of the principle, and executed, in all its steps, with minute attention to circumstances, under the immediate eye of the physician himself, the result may be presumed to be favourable; at least a course will be opened through which a favourable result may be attained. When the patient is disposed in bed, in a warm but well ventilated apartment, it is advisable that the bowels be excited to

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effective action by a warm and stimulating purgative. No one of the purgative class has appeared to myself to be so well adapted to the purpose, in the case in view, as purging tincture of aloes and myrrh, quickened in its action by the addition of an ounce or more of rectified oil of turpentine — The drink, or dilution given as auxiliary, at this time, is to be warm, stimulating rather than insipid; the internal remedies, such as are calculated to maintain activity of circulation in the extreme vessels, without exciting high or inordinate action in any. Of these, a bolus, composed of camphire ten grains, snake root fifteen, nitre fifteen, James' powder four, and carbonate of ammonia five—more or less according to circumstances, comes nearer to the purpose than any other with which I have made experiment—It is to be borne in mind that the main object of cure consists, at this stage of the business, in supporting the impression which maintains the forward course, but which does not incur the risk, by quantity or quality of stimulation, of exciting it to excess—an occurrence liable to be followed by an exhaustion that, in the present state of things, is not remediable. Besides the support, which the forward course obtains from what may be strictly termed medicinal aid, diet, regimen and external applications have an important share in maintaining the salutary tendency now excited; they are, in fact, the means through which alone we can expect to give it permanence. Wine, cyder, bottled porter, profusion of fruit, frequent abluion of the skin and

change of linen, gestation in the open air in suitable carriage, frictions of the skin with stimulating oils, with lime juice and salt, or vinegar and salt, even with brine of beef or herrings,—and, for the more refined, sprinkling or washing the body with *eau de Cologne*, are the principal of the means to be employed for the purpose stated,—singly and combined, or alternated with each other according to the varying circumstances of the case.

I have stated, at some length, the manner of proceeding which I adopted, in so far as I could obtain means of execution, for the cure of fever of the gangrenous tendency in the latter stages of its course. I have evidence of the benefits of the practice from experience; but, as the practice is unusual, it may not be unnecessary that I state the causes on which I suppose its good effects to depend. It does not belong to this place to enter into discussion on the nature of the powers which influence modes of action in the animal system, and thereby constitute different forms of temperament. It is sufficient to know that such differences do exist, and that they depend upon causes—at one time more general, at another more local. The tendency in the habit which I term gangrenous, arising from influences which we do not pretend to estimate, is sometimes general or epidemic, sometimes local—visibly connected with local causes, and sometimes artificial—the direct product of causes generated by our own faulty arrangements. But however the temperament, or tendency to temperament be produced, a change in the crisis

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of the blood is perceived to arise under its existence, viz. an apparent diminution of energy or vitality, indicated by slow movement, or stagnation in the venous system, particularly in the veins of organs of spongy texture. This disposition constitutes disease: it is the first step in the process, and, as it is the first step, it is the direct object of the physician to remove it before it make a second. We are ignorant of the nature of the matter of life: we are capable of observing the existence and operation of causes which raise or which depress the expressions of it. If expression be weak, it is obvious that it ought to be stimulated to greater exertion; if strong, that it ought to be lowered to a just level. The difficulty lies in the execution, viz. in obtaining correct knowledge of the power of means, and in adjusting, with precision, the mode of applying them. Addition is generally supposed to be stimulant; abstraction is supposed to be depressive.—The supposition is only relatively true. Experience furnishes numerous proofs that no power of stimulation, which can be applied to an animal body, uniformly succeeds in moving a safe and vigorous action under the stagnations which occur in certain forms of gangrenous fever; and further, the records of practice shew no less clearly that instances are numerous, where safe and vigorous action has, under the same circumstances of disease, followed copious depletion, which is usually deemed depressive. If we consider the animal body, in so far as respects the circulation of the blood and humours, as a hydraulic machine,

the movement in the canals of which is impeded by various causes of obstruction, we are forced to admit that impulse *a tergo* will either clear away the obstruction and thus open the passage, or, doing violence to the sides of the canal if the resistance be insurmountable, it will necessarily produce extravasation and its consequences. The one or other of these must follow as a result of simple stimulation from causes which urge the course by force. On the other hand, if the canals be obstructed by undue local accumulations; and if, by an opening made in a vein, the obstructing mass be moved towards the opening, accumulation or obstruction is withdrawn from the part. Circulation is equalized throughout; and, if no violence has been done to the sides of the canal by the excess of previous accumulation, the first step of the curative process is made on sure ground; the disease is in fact cured, or its condition is so changed that it may be easily cured. The effect stated is the direct consequence of abstracting blood from the veins; and, being so, the reader may perhaps comprehend in what manner the dangers of the gangrenous form of fever are obviated by means of blood letting, as he may form an opinion, in another view of the case, in what manner the same dangers may be overcome by stimulation through addition of quantity forcing a barrier. But while the form of disease, now under consideration, is sometimes removed by stimulations through addition, sometimes by depletion through abstraction simply and unassisted, yet, simply and unassisted, the one or

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the other often fails; combined and employed in succession, they generally succeed, unless where the structure of important organs has suffered actual violence from distention prior to application, or where the principle of life has been exhausted by a sudden explosion, similar to electric explosion—an occurrence not uncommon during the reign of malignant epidemics, or in crowded and infected hospitals at any time. It is here stated that stimulation and abstraction fail singly, that they succeed as combined and judiciously alternated. I may add, in illustration, that external local gangrene often remains insensible to the action of the most powerful stimulants, or to depletion of blood by scarification as singly and simply employed; that depletion, by scarification or otherwise, followed by powerful means of stimulation, rarely fails to produce an effect—often beneficial and decisive. The fact is plain; it is submitted, in many instances, to what we may term ocular inspection. If the fact be clear in the case stated, the inference may be with safety applied to disease of the general system; at least I have myself, acting on this principle, employed depletion and stimulation in succession or combination, alternating them variously in the course of the proceeding according to change in circumstances, and I have done so with the conviction of so much benefit to the subjects of the experiment, as forces me to recommend the practice to the consideration of others.

The salutary effects resulting from the method now recommended, viz. depletion and stimulation alternated and combined, may be attained, and the reason of the thing may be comprehended though we regard the blood as a mere inanimated mass. It rests on removing resistance; and, when resistance is removed, in stimulating the acting parts into action. But, if the blood be regarded as an animated fluid in a primary stage of organization, it is evident that the sphere of bleeding is extended, and rendered of infinitely more powerful effect as a remedy than it otherwise would be: it becomes in fact the remedial key, if one may use the expression, of the whole organic actions in the system.—It does not belong to this place to move a question respecting the vital condition of the blood. It is evident to observation that the mass of blood is a mixed body possessing a peculiar constitution; and it is moreover evident that changes, produced in its quantity by abstraction, produce changes in its actual condition. These are sudden, often visible to the eye while the blood flows from the vein; and, while visible, it is further observable that muscular and organic action generally takes its characteristic feature from the changes, thus produced upon the blood by diminution of quantity, viz. brisk or languid, as the blood assumes or loses its activity of cohesion. It was the observation of this and similar facts which induced me to employ blood-letting simply, or combined and alternated with stimulation in forms of fever to which it has been rarely applied.

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—The diminution of quantity produced a change on the crisis or constitution of the blood; and, as it appeared to myself, the character of the organic action followed the character of the change which was induced upon the blood's condition. If this be so, blood-letting becomes a remedy in fever, not only in so far as it diminishes quantity and equalizes circulation; but as it changes condition, whereby it contingently rectifies quality, and produces correspondent healthy action throughout the whole organic series of the system.

Intermittent.

The intermittent form of fever occurs frequently under the existence of the gangrenous constitution; that is, the force of the febrile cause is so concentrated and so modified, in certain places and in certain seasons of the year, as to produce that species of stagnation in the venous system which is here termed gangrenous. The method of cure rests on the common base of cure recommended to be applied to the continued fevers of the gangrenous temperament, only it is to be borne in mind that, as the action of the cause recurs at particular times, and as the first act of the recurrence is often dangerous, the dangers are to be obviated by anticipation. With this view it is recommended, where intermittents of the gangrenous or malignant character prevail, that, together with all the means usually employed for prevention, the circumstances of the patient be narrowly watched for some hours previous to the expected return of the paroxysm, that warm baths be in readiness, that a medical



officer be in attendance, that the patient be immersed in the bath on the first feelings of indisposition, and that, in about ten or fifteen minutes after immersion, a vein be opened in the arm, the blood allowed to flow until the signs of internal congestions of all kinds be evidently removed,—a condition cognizable by accession of ease and freedom in organic movement, and comparatively pleasurable sensation throughout the whole system. It is not possible to say *a priori* what quantity of blood will be sufficient to produce the effect; in general it will be large. A large quantity may be abstracted with safety while the body is immersed in the bath; and, as it is then safe, it would be unpardonable to desist before there be evidence that the purpose, for which the remedy was prescribed, has been attained. When a change in the appearance of the blood as it flows from the vein, and a change in the general feeling and sensation of the patient as immersed in the bath, indicate a decided change in the condition of the disease, the patient is to be carefully removed from the bathing tub, wiped dry, rubbed with hot flannels, and afterwards with hot and stimulating oils, a blister applied to the nape of the neck, extended to the interval between the shoulders, and every other precaution taken, through regimen and medicine, to prevent recurrence to the original characteristic action. Such is the outline; it is unnecessary to go into detail.

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## CASE I.

Barbados, *August, 6th, 1813.*—J——n, an officer of regular habits, became heavy, languid, and anxious, complaining of slight head ache,—the pulse slower and less energetic than natural. Between thirty and forty ounces of blood were abstracted from a vein in the arm: he became somewhat faint and the arm was bound up. The pulse was now free, open and more frequent than natural, the sensations light and comparatively pleasant. A sense of fainting, somewhat spasmodic, recurred three or four different times in the first two hours after the abstraction of blood; but, after every recurrence, the sensations of health and comfort rose to a higher pitch than they had been, somewhat in the manner as if something noxious had exploded in the act of fainting until it was expended, and the natural condition of things fully restored. A blister was applied to the nape of the neck; a purgative of brisk operation was given internally:—health was fully and speedily restored.

## CASE II.

Barbados, *March 10th, 1814.*—C——l, an officer, a young man of regular habits, felt unwell, but could not explain his feelings. He had no appetite, and he rejected the most of what he eat or drank: the countenance was rather dark; the eye clear: he had sensations of uneasiness, anxiousness, and weight in the hypogastric region; the pulse slower than natural; sleep disturbed or wanting. He was supposed to be threatened with a fever of the character that tends directly to venous stagnation; and it was accordingly thought proper to anticipate the occurrence of it by abstracting a large quantity of blood from the veins. About two pounds and a half were drawn off by a large orifice while he lay in a recumbent posture. He was instantly relieved, slept sound, rejected no more of his food or drink; and, after the operation of a brisk purgative, found himself light and cheerful and in perfect health.

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Barbados, *August 2nd*, 1812.—Schoenmaker, R. Artillery, aged thirty-three, admitted into hospital to-day, complaining of pain of the head and limbs, chilliness succeeded by heat, frequency of pulse and great thirst. Calomel gr. iv. P. antimony gr. ii. *3rd*,—no proper evacuation from the bowels; heat of the skin diminished; calomel gr. iv., rhubarb gr. xii. *4th*.—seems easier, but complains of pains in the region of the stomach. Infusion of senna, oz. ii., kali gr. vi.—to be given immediately and repeated every second hour; blister to the epigastrium. *5th*,—several evacuations by stool during the night; skin yellow. Saline mixture with antimony and camphire every fourth hour. *6th*,—decoction of bark—two ounces with ten grains of snake root and four grains of kali three times a day. *7th*,—medicines continued. *8th*,—decoction of bark continued with the addition of infusion of senna, rhubarb and kali. *9th*,—difficulty in making water: camphorated mixture with ætherial spirit of nitre. Effervescing mixture every fourth hour: common clyster. *10th*,—voided some urine, but not freely. *11th*,—restless in the night,—an involuntary stool in bed; now quiet, as if sleeping or dozing; yellowness rather increases; pulse intermits; swallows wine—with more or less of arrow root,—refuses medicine. *12th*,—a discharge of blood, from the mouth and by the anus, in the course of the night: extremities cold and clammy: pulse scarcely perceptible:—comatose. Died at 10 in the morning. *Opened*.—Liver preternaturally large, distended with thin dark blood which ran out in great quantity when the knife penetrated its substance: the gall bladder contained bile, but in no great quantity: the intestines were deeply coloured with bile,—the veins of the intestines and of the mesentery unusually distended with black blood.

## CASE IV.

Barbados, *March 25th*, 1814.—Alexander Calder, R. Artillery, recently arrived from Europe, under thirty years of age,

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a strong and fine looking man of a full habit, had been drinking perhaps to excess in the evening, and was brought to the hospital about midnight in a state of stupor and insensibility—the face flushed, &c. Bled immediately to the extent of three pounds: he recovered his sense and recollection, but not perfectly: immersed in a warm bath; skin rubbed with soap and scrubbed with brushes: calomel gr v.: a draught of tincture of opium and æther: head shaved and blistered. *26th*,—great irritability at stomach; little or no sleep; head relieved; pulse full,—not accelerated beyond natural; bowels not moved. Solution of salts,—instantly rejected. Bled to the extent of two pounds: warm bath: draught with tincture of opium and æther; castor oil at the interval of half an hour. Noon,—the castor oil retained,—no evacuation by stool: solution of salts. Evening,—head-ache considerable; pulse full and frequent; bowels obstinate. Bled to the extent of two pounds: cathartic extract in pills,—stimulating clyster. *27th*,—stomach retentive; four stools in the night; skin preternaturally dry. Solution of salts with aqua ammoniæ acetata. Evening,—nausea,—no actual vomiting. Effervescing draught with some drops of tincture of opium at bed-time. *28th*,—slept comfortably,—much refreshed,—perspiration in the night copious; no head-ache; nausea entirely removed; three evacuations by stool in the course of the night: diaphoretic mixture. *29th*,—restless in the night from irritation of blisters,—no sleep; skin hot and dry; circulation free and vigorous. Evening,—no desire to sleep: anodyne draught. *30th*,—much relieved by sound and refreshing sleep; perspiration free: diaphoretic mixture continued. *31st*,—seized suddenly in the night with a violent and acute pain in the right side, a short dry cough, impeded respiration. Three pounds of blood were abstracted from the arm,—the blood covered with a dense and tough crust: warm bath; large blister to the side; relief from the bleeding instantaneous: purging mixture in repeated small doses. *April 1st*,—cough unabated,—the expectoration—mucus with mixture of blood; respiration impeded,—pain considerable in attempting a full inspiration; the pulse full and frequent. Bleeding repeated to

the same extent as yesterday; relief under the flowing of the blood: purging salts: blister to the breast: small doses of ipecacuanha every fourth hour. *2nd*,—easier than yesterday; no expectoration; bowels open; pulse frequent: mucilaginous mixture: tincture of digitalis. *3rd*,—slept in the night,—seems better: pectoral medicines continued. Evening,—return of pain in the breast—particularly on deep inspiration: bled to the extent of one pound: anodyne draught at bed-time. *4th*,—bowels locked: cathartic repeated. Evening,—no effect from the purgative: castor oil; and, at a short interval, a clyster. *5th*,—evacuations by stool during the night. Ipecacuanha with tincture of digitalis in small doses. Evening,—return of pain in the chest;—pain sharp; cough distressing: bled to the extent of two pounds;—temporary relief: blister to the side: the event very doubtful. *6th*,—restless and distressed; pulse small and feeble: anodyne at bed-time: wine, &c. *7th*,—sinks:—the circulation impeded; the pulse scarcely perceptible at the wrist. Died about half past eight in the evening. *Opened*.—The marks of the disease which proved fatal were chiefly conspicuous within the cavity of the thorax. The right lobe of the lungs red, or livid exteriorly,—blood extravasated in its cellular texture as if from the rupture of a vessel; interspersions of purulent matter; tubercles and vomicæ in other parts; adhesions with the pleura very intimate; a large abscess in the most inflamed part—the quantity of pure matter at least one ounce and a half. The lungs adhered likewise on the left side; but the adhesion did not seem to be recently formed. The pericardium was distended with fluid in unusual quantity: the substance of one side of the heart was unusually tense; and, in cutting into it, a quantity of bloody serum flowed out: the other side was extremely flaccid as if deprived of the common density of texture by the action of some morbid cause. The liver was large in size,—distended, but without apparent change of structure: the gall bladder was full of bile.

☞ The above case was interesting in its course, both on account of its medical importance, and on account of the character of the subject—  
one of the finest men in the corps, and one of the best conducted in his

CHAP. ordinary life. He had drank too much previous to the attack; but he was  
 VII. not a drunkard. I left him on the 30th of May, as I thought likely to  
 recover, though not beyond chances of danger. When I returned on the  
 9th of April, I found his death recorded in the case-book with the dissec-  
 tion as here transcribed. The first character of the disease seemed to be  
 such, as I include under the head---gangrenous from excess. There were  
 marks of stagnation at the commencement; obstinate torpor in the course;  
 the termination, or cause of death seemed to be a local explosion of a  
 gangrenous tendency on a vital organ,---an occurrence not uncommon in  
 relapse: it was here an accident not within calculation according to the  
 rules of common prognostic.

## CASE V.

Barbados, *March 26th*, 1814.—W. Gardiner, R. Artillery, under thirty years of age, recently arrived from Europe, brought to the hospital in a state of torpor, the pupils dilated, the countenance deep crimson. The temporal artery was opened immediately and three pounds and a half of blood were abstracted: recollection returned: warm bath: frictions with soap and brushes while in the bath; head shaved and blistered; calomei; solution of saits. Evening,—free from pain. *27th*,—restless night; evacuations by stool—copious; thirst great; tongue white;—otherwise better: purging mixture with diaphoretic draught. *28th*,—head-ache in the night;—no sleep; pain in the abdomen; pulse frequent and hard; thirst great. Bled to the extent of two pounds: warm bath: solution of salts. *29th*, better; slept a good deal; bowels opened: diaphoretic mixture. *30th*,—free from fever: infusion of bark. *31st*,—medicines continued. *April 1st*,—medicines continued. *2nd*,—discharged.

## CASE VI.

Barbados, *August 5th*, 1811.—B—, R. York Rangers, had been indisposed for some days and was admitted into the hospital to-day, but was not able to give a very distinct account of himself. He appeared to be torpid both in mind and body; the countenance was heavy and bloated; the breathing heavy and oppressed—with more or less of cough; a dull

oppressive pain of the head; the pulse frequent, small and weak; the skin dry. Purgine mixture; blister applied to the chest:—very uneasy and uncomfortable. Bled, (the quantity not stated)—the blood black; it flowed with reluctance,—the relief not remarkable; the pulse frequent,—without elasticity; the head heavy; the faculties dull; breathing still oppressed: head shaved and blistered: the physic has not yet operated. *6th*,—very uneasy in the first part of the night—anxiety and oppression extreme: an injection was given; the physic operated, and, after some evacuations, a draught was given of æther, ammonia, and Hoffman's anodyne liquor. Much better at *6* in the morning,—the head clear; the countenance animated; the breathing easy; the tongue clean; perspiration free and fluid; skin cool; pulse slow,—not weak; no appetite. *12th*,—recovered and discharged.

## CASE VII.

Barbados, *August 11th*, 1813.—A—, R. Y. Rangers, was attacked with symptoms of fever and brought to the hospital insensible and motionless. A vein was immediately opened in the arm and four pounds of blood were abstracted before he recovered sense and motion,—an emetic was given, as soon as he could swallow, which, operating effectively upwards and downwards, brought perfect relief: the head shaved and blistered: a blister also applied to the nape of the neck as preventative of recurrence. *20th*,—discharged in health.

## CASE VIII.

Barbados, *May 24th*, 1814.—A—n, R. Artillery, admitted in the morning, complaining of severe pain in the head, considerable fever and also purging. Bled to the extent of four pounds:—fainted and continued long faint; the head relieved; the tongue and lips dry; the pulse regular,—not frequent,—without energy; the skin dry and flaccid: calomel followed by solution of salts. Evening,—pain still felt at the forehead, but

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less severe; pulse regular, but weak; skin not animated; evacuations by stool frequent.—not effective. Warm bath: friction of the body with lime juice and salt: æther and laudanum internally. *25th*,—slept, and, according to his own report, sweated copiously in the night; three stools; some pain in the bowels; no pain of the head; considerable thirst; lips dry; skin flaccid,—not animated; pulse more frequent than natural,—weak and compressible—without energy; countenance of a hectic flush; respiration calm; no nausea. Evening,—rather better; tongue rather clean; skin flaccid; pulse without energy; heat rather below natural; feelings more comfortable; less purging. *26th*,—three or four evacuations by stools during the night; pulse somewhat more vigorous, but still under the natural energy; the tongue red; the eye clear. Draught—charcoal, ammonia, and lime juice at intervals of three hours. Evening,—skin and countenance more animated—warmer; perspiration; no pain of the head or bowels. *27th*,—better,—animated; no ostensible fever; bowels regular. *30th*,—recovered—discharged.

CASE IX.

Barbados, *August 16th*, 1814.—K——n, R. Y. Rangers, seized suddenly with oppressive heaviness, inability and feelings not easily defined, the pulse sluggish and obscure, or impeded. Bled to the extent of three pounds; the pulse became frequent, open and energetic; the sensations light and easy. *17th*,—no ostensible fever; weakness without pain; no evacuation from the bowels from a strong dose of jalap and calomel; no nausea; little thirst; pulse regular; sweated in the night—profusely according to his own account. Evening,—evacuations by stool. *18th*,—seized last night with severe head-ache; skin now dry; the pulse of febrile frequency. Bled to the extent of three pounds; bathed; blistered. *19th*,—return of fever during the night; now better. *20th*,—better; no vomiting; pulse nearly natural; tongue clean. *21st*,—better. *25th*,—recovered. *28th*,—discharged.



## CASE X.

Barbados, *November 3rd*, 1814.—A sergeant, (European) of the 8th West-India regiment, was attacked in the afternoon with chilliness, head-ache, sharp cutting pains about the stomach, tremors, agitation and great distress,—brought to the hospital in the night and bled to the extent of three pounds: the violence of the pain of the head diminished, the pain not removed; tremors and agitation considerable; tongue dry; thirst great. Six in the Morning,—bled to two pounds; faint and languid; head-ache removed; some sensation of heaviness remains; tremors and agitation ceased; head shaved—washed with vinegar, salt and rum—and covered with a strong blister; purging bolus. Noon,—head quite relieved; pulse nearly natural; thirst continues; heat natural; no tremor or agitation: body not yet opened. *5th*,—slept soundly; perspired freely; bowels open; no pain or uneasiness. *6th*,—slept and perspired; slight febrile commotion. *7th*,—better. *8th*,—improves. *12th*, discharged.

## C. SECTION III.

*General Plan of Cure, where the Action of the Disease is manifested on the Lymphous or Phlegmatic Base of Temperament.*

The forms of febrile action which occur under the predominance of lymphous temperament, the outline description of which is given at *pages 103 and 107*, are numerous and of considerable variety, whether progressive or retrograde. As the forms of the disease are various, the means to be employed for combating the effects are various also; and, in many cases, the rule of proceeding is not easily ap-

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prehended. The cause, which constitutes the lymphous or phlegmatic temperament in the individual habit, seems to refer itself to disproportion in quantity, or unappreciable disposition in the quality of the coagulable lymph, or adhesive part of the blood. The cellular membrane is the subject upon which the action is manifested; the act manifests congestion and diseased accretion, in part, or in the whole of what may be termed the cellular expansion. The cure of this form of disease, modified as it may be by circumstances, rests upon the same general base as the cure of other forms of fever, viz. arrest of the existing diseased action, and excitement of action that is analogous to that of health. The principle is clear; the execution is often complicated, so complicated indeed that I am not confident that I shall be able so to explain and illustrate it that the reader will easily comprehend it.

Mild Form.

1. If a person be submitted to medical care at an early stage of continued fever, as it acts on the lymphous base of temperament with a minor degree of force only, it is recommended that he be placed, as soon as possible, in a warm bath impregnated with kali or pot-ash and of rather high temperature, that the body be rubbed with soap and scrubbed with brushes, and, after the skin has been animated by warmth and purified by scrubbing, that a vein be opened in the arm, and that blood be allowed to flow until there be evidence that a change is effected in the existing condition, an occurrence expressed by changes which take place in the action

of the heart and arteries, and in the aspect of the eye and countenance, viz. a change in the pulses, from drawling and inelastic, to quick and energetic, in the eye and countenance, from dulness and statue-like immobility, to animation and expression. When the change contemplated, as the result of bathing and bleeding, has been attained in the requisite degree, the arm is to be bound up, the patient removed from the bathing vessel and laid upon a couch in a warm apartment, rubbed dry with linen towels; subsequently rubbed with flannels heated at the fire, and finally with a liniment of olive oil and water of ammonia—the ammonia in a high proportion. From the couch, after being properly equipped, he is to be conveyed to the ward allotted for him, disposed in bed and carefully covered with bed clothes. Emetics are often beneficial in this form of disease as exhibited in the common manner; the benefit is more certain, if a pint or more of tea, rice water, or other beverage, in which forty or fifty grains of kali have been dissolved, be given previously to the exhibition, even if more or less of kali be added to the water that is given for the purpose of working it off. Of purgatives, the alkahzed infusion of senna—with the addition of acetated water of ammonia, has appeared to myself to be the best. The other internal remedies are not numerous.—The muriate of ammonia in large doses, viz. a drachm every three or four hours,—powder of snake root twenty grains,—camphire ten, made into bolus, is also a suitable and efficacious form. If the effect of these means be assis-

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ted by friction with liniment of olive oil and water of ammonia, the ground, gained by the first proceeding, may be expected to be maintained, the re-establishment of health may even be expected to be assured.

If a person, suffering from fever of a similar character and of a similar degree of force, be not submitted to medical care until a late stage of the disease, viz. the fourth or fifth day from the attack, though the principle which directs the method of cure be the same, and the means to be employed be also the same, more caution is required in the application of them, and there is less certainty of the effect produced by them. The same mode of proceeding is to be pursued in the management of the bath here as in the early stage; but blood is to be abstracted at intervals rather than at once, though not at longer intervals than such as assure from the dangers, arising from sudden and large evacuation, in a state of feebleness or torpor. The arterial action is not high at any time. It ordinarily becomes higher under bleeding; and bleeding rarely in this case occasions sickness and fainting. But, as it is unpardonable to expose the life of a patient to chances of danger that may be avoided, and, as it is possible that dangers may arise from profuse bleeding at a late period of fever, it is here recommended that blood be abstracted with a secondary rather than a primary object in view, viz. with a view to change conditions gradually rather than to arrest actions precipitately. When this has been done to a certain extent, the completion

of the cure may be committed to emetics and purgatives administered in the manner before directed, aided by frictions with liniments of oil and ammonia, snake root and camphire given internally, plentiful dilution of alkalized drinks, warm and dry air, &c.

2. Where the disease in question is of the major degree of force, and where it is presented to the physician at an early period of its course, viz. within twelve or fourteen hours after the attack, the principle which directs, and the means which effect the cure are still the same as in the preceding: the quantity of means required is greater, and the application of them is to be made under a bolder exercise of the principle. I have nothing to add on the subject of bathing to what has been already said. Bleeding, though the symptoms indicate no increase of arterial excitement, may be carried to a great extent; and, it must in fact be carried to extremity where the brain or lungs sustain more than an equal degree of the febrile action. Where the countenance is heavy and inanimate, the eye white and torpid, bleeding is the remedy;—the blood is then to be drawn while the body is immersed in the bath, the orifice large, the jugular vein, where it can be conveniently done, opened in preference to a vein in the arm. Fainting rarely occurs from loss of blood in this form of disease. Four pounds have been abstracted in many cases, five, and even six in some, without producing the least disposition towards it. When a change has

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been induced by bleeding, or when bleeding has been carried as far as it can be carried at one time, without compromising the safety of the patient's life, the body is to be removed from the bath, and treated in the manner that has been already described; only, as the case is stronger, all the means are to be carried farther and applied with long and persevering assiduity. If no decided change, or no evident tendency to favourable change occur after an interval of twenty hours from the commencement of the discipline here enjoined, it is necessary that the patient be re-conducted to the bath, that the process of bathing be repeated in all its parts, that a vein be opened, and blood abstracted to the extent of three or four pounds; in short to such extent as produces a change in the circumstances of the case, the physician observing, with a careful eye, the appearances which arise under the flowing of the blood, and permitting himself to be guided in his course by the indications that these appearances suggest, rather than by the influences of pre-conceived opinion. After the arm is bound up, and the patient has reposed for some time immersed in the bath, he is to be raised up, placed upon a stool, and submitted to the affusion of cold salt water upon the head and shoulders. He is then to be treated with frictions as on the former occasion, and carried back to his bed with all necessary care and precaution. If there be signs of congestion in one part more than another, it will be proper to apply a blister as near

as possible to the seat of affection; and, on this ground is is advisable, as precautionary, that the head be shaved and covered with a blister, extended from the head along the neck to the interval between the shoulders. Ammonia, camphire, and nitre are to be given internally in large doses; every drink and nourishment is to be alkalized:—wine or other cordial may be necessary on some occasions.

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The above measures, harsh and empirical as they may appear to be, imply no danger to the life of the patient, if they be conducted with requisite precaution under the eye of a discerning physician; and, while safe, I am warranted to say, from experience, that there will occur few cases of recent fever capable of resisting their power, if times and circumstances for their application be proper, and if none of the requisite accompaniments be neglected. But if the disease hath attained a late stage, that is, the fourth or fifth day before it is submitted to the care of the physician, the strong practice now recommended, though sovereign at the early period, has, at this time, no place. Congestions are, for the most part, already formed in the more important of the internal organs, the removal of which can only be effected slowly and imperfectly, if it can in fact be effected at all. Bathing still continues to be a remedy. The abstraction of blood cannot be carried to great extent at one time,—not perhaps to exceed twenty ounces: it may be repeated, and it must in fact be repeated

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frequently. Bathing, bleeding, and frictions, combined and alternated, in such manner, as to agitate and change by impulse the condition of the whole circulating mass, constitute the cardinal means of remedy. The internal use and the external application of the whole alkalescent tribe aid the general purpose; and mercury, given internally, applied externally, and so directed as to excite salivation, presents itself on this occasion as a remedy of great value. The case is difficult; but, difficult as it is, something may be done by perseverance and well timed application of suitable means:—the physician who studies principle knows how to act.

Periodic.

3. A fever of the periodic form appears frequently under prevalence of the lymphous temperament, more frequently perhaps than under any of the others. If it be submitted to medical treatment at an early period, and treated with decision upon a sound principle when so submitted, it is safely and speedily cured: if it be allowed to pursue its own course without interruption, or if it be feebly opposed by art, it extends to a great length of duration; and, when finally said to terminate, it ordinarily leaves the subject in an impaired and valetudinary state of health. When the subject of periodic fever is presented to the physician, and when the character of the temperament under which the disease acts is ascertained to be lymphous, the body is to be immersed, at the commencement of the paroxysm, in a warm bath of high temperature; and, as soon as the sensations of cold are removed and



the surface animated by heat, a vein is to be opened in the arm, the blood allowed to flow, the changes, which occur in the appearance as it actually flows, and the changes, which take place in the pulses of the heart and arteries and other functions of the system during the abstraction are to be minutely noted; so that the information of condition, thence obtained, may be available in directing the proceeding, that is, in regulating the quantity which is to be drawn off at one time. The quantity must necessarily vary according to circumstances, viz. condition of subject and condition of disease. When depletion has been carried to a just point, and when susceptibility to ordinary impression has been thereby restored, the patient is to be removed to a couch in a warm apartment, the body wiped dry with linen towels, afterwards rubbed dry, even rubbed for some length of time with flannel cloths heated at the fire, and finally with a liniment of olive oil and ammonia,—the ammonia in high proportion. This preparatory process being finished, the subject of it is to be conveyed to bed in his proper ward, a pint of warm tea, or rice water given immediately—with the addition of forty grains of salt of wormwood; and, in half an hour, an emetic—tartarized antimony in preference, administered with all the precautions that are necessary to be observed in giving emetics. As soon as the operation of the emetic is finished, a purgative is to be given:—jalap and calomel, with twenty grains of salt of wormwood, is the most convenient and the most efficient. All the drinks are to be alka-

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lized:—acetated water of ammonia is useful, as given at intervals under the operation of the purgative. By these means, the subject may be considered as prepared for the exhibition of Peruvian bark; and, if the type be single tertian, there is ordinarily time to give bark in quantity sufficient to prevent a return of the paroxysm, at least to act so as to diminish its force when it does return. Two drachms of bark, fifteen grains of snake root, and thirty of muriate of ammonia, given every two hours, rarely fail of repressing it. Cobweb, to the amount of ten or twelve grains, given at an interval of two hours before the expected return of the paroxysm, and repeated a short time preceding the actual hour of invasion, does it still more effectually.

Organic  
Congestion.

If the disease has been of long standing, the mode of preparation for the exhibition of bark is not so simple, nor the effect so certain, even when the preparation is supposed to be made as it is in the case here stated. As congestions are already formed, in a greater or lesser extent, in the interior of one or other of the internal organs, most commonly in the organs contained in the abdominal cavity, it is evident that these must be, in some measure, resolved before bark can be given with a confident expectation of benefit. Bleeding, repeated at intervals, but not to great extent at one time, frictions with liniments, friction with mercurial ointment, carried to the extent of exciting salivation, alkalized drinks, the juice of alkalescent and deobstruent herbs, viz. wormwood, dandelion, scurvy

grass, &c., diet of a low scale, with exercise in the open air on horseback or in a carriage, combined, alternated and modified to circumstances, constitute the chief means of preparation. If the basis of the congestion be moved by a judicious application of the means stated, the habit, as rendered susceptible of general impression in consequence of their action, is brought under the controul of a general remedy; peruvian bark is generally considered as that remedy. It maintains the character of specific, where the condition is simple; it does not support the claim, where it is complicated; it even sometimes fails, as given singly and in the common manner; it has not failed in my own experience, not even in the quartans of Walcheren origin, as given in the following manner, viz. two ounces of bark, half an ounce of snake root, half an ounce of flowers of sulphur and two drachms of salt of wormwood made into an electuary with aromatic syrup.—The size of a large nutmeg of the electuary was given every two hours, with injunction that the whole should be taken in the existing intermission, and that a blister should be applied to each wrist about six hours before the paroxysm was expected to return.—It is to this form of disease that arsenic has appeared to myself to be well adapted—to be in fact more certain than bark in the manner that bark is commonly administered.—An emetic of white vitriol is effectual in many cases. Cob-web maintains pre-eminence—even here above all other remedies.

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As the fevers which occur in the lymphous temperament, continued or periodic, are not accompanied, according to the description at *page 103, 107, &c.* with symptoms which are ordinarily thought to authorize the employment of some of the means here recommended for their cure, I shall state, in a few words, the manner by which I was led to adopt these means, with the reasons which induce me to adhere to them, and to press them upon the notice of others for adoption.—A pneumonic form of disease fell under my observation in the year 1801, while I superintended the hospitals of the army depot of recruits and invalids then stationed at Chatham. The disease was epidemic for some months and considerably fatal. The symptoms were not urgent, or such as indicated, in common opinion, such degree of inflammation as authorizes abstraction of blood in large quantity. Abstraction of blood was not therefore carried to any extent at the first appearance of the epidemic; but, as the bodies of those who died were generally opened, the dissection of the dead body discovered a condition of things, which induced me to adopt a different and more decided plan of treatment than that which had been hitherto employed. Marks of suppurative inflammation and actual abscess were observed in the lungs in many cases. In others, no marks of suppurative inflammation were discernible; but the lungs were notwithstanding diseased, viz. the substance was agglutinated into a mass, so as to be rendered in a manner impermeable to air; the cavity of the thorax, and frequently the cavity of the

pericardium was distended with water; masses of coagulated lymph plugged up some of the larger vessels; blood—black and incohesive filled the cavity of others. From this view of the case, the disease in question was considered as a form of pure adhesive inflammation which tends to agglutination; and so considered, I thought myself warranted to make trial of blood-letting as a remedy—either absolute or auxiliary;—and I made it with success. The blood was generally of an azure colour as it began to flow from the vein: it became gradually more florid in the course of flowing; and, before the arm was bound up, it was sometimes of a bright scarlet red. The blood that was first abstracted, presented in the vessel into which it was received a mass of uniform appearance of loose cohesion, of azure colour—and with little separation among the parts: the second had more cohesion, less of the azure colour, and a great proportion of serum: the third had often a firm cohesion, a bright colour, and a large proportion of fluid serum. With these changes in the appearance of the blood, as it flowed from the vein, or as were visible in the mass when it was received into a vessel and suffered to rest, corresponding changes were uniformly observed to take place in the activity and energy of animal action; hence, reflecting on the reasons of the changes thus produced, I adopted abstraction of blood as a remedy, not only in the view of diminishing quantity and relieving from congestion, but as effecting a change in the constitution of the circulating mass;

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whereby I concluded that the whole organic series might be influenced, so as to assume a new form of action corresponding with the change induced upon the blood. This forms the basis of the practice, and this is the explanation of the grounds on which it was adopted. The other parts of the treatment are obvious and easily understood, viz warmth and friction in the view of exciting energy of action, and of supporting the actions that have been excited after the abstraction of blood; alkalies and drinks, &c., in the view of acting on the fluids. These last dissolve mucus or phlegm directly where they come in contact with it; they attenuate it as conveyed into the circulating mass.—The plan of cure, now detailed, was digested in some degree under the influence of theory: it has been applied in practice with a success that leaves no doubt, in my own mind, of the propriety of recommending it to the notice of the public.

## CASE I.

Barbados, *July 25th*, 1814 —George Rook, R. Artillery, aged 25, admitted into hospital early this morning. He complained severely of pain in the head; the bowels were constipated; there was no appetite; the tongue was foul; the pulse full and frequent. Three days ago he felt chilliness, tremors and other indisposition; but he continued at his work, which was that of a blacksmith. He was bled, soon after admission into the hospital, to the extent of three pounds:—fainting supervened: he was immersed in the warm bath for twenty minutes; and, on being taken out of it, was submitted to cold affusion. When dried and disposed in bed, a draught, consisting of tincture of opium, æther, and aqua ammoniæ acetata

was administered; and, at an interval of two hours, six grains of calomel, followed by a solution of purging salts. Noon,—castor oil, the calomel and salts not having had effect. Evening,—the skin hot and dry; the pulse full,—not open; thirst considerable; bowels refractory. Bled to the extent of two pounds: tepid bath,—chilly while in the bath,—removed from the bath, disposed in bed: a stimulating clyster,—small evacuation in consequence. Midnight,—tension and uneasiness in the abdomen,—no acute pain: infusion of senna, salts, and aq. ammon. acet. at frequent intervals during the night: friction of the abdomen and extremities with mercurial ointment. *26th*,—slept a little during the night; one small evacuation by stool; the tongue moist; thirst diminished; torpor pervades the whole of the animal functions; the action of the heart and arteries sluggish,—not energetic. Castor oil: frictions of the whole body with salt and vinegar: a blister to the nape of the neck. Noon, copious evacuation by stool; some repose, and a slight moisture on the surface; thirst moderate. Effervescing draught at intervals: frictions repeated—salts and senna. *27th*,—some sleep; occasional confusion in the head—with tendency to wander; tongue red; constant desire to drink: no effect from the salts and senna: castor oil:—a clyster to be given, if necessary. Noon,—the lower bowels emptied by the clyster; no effective stool; complains of uneasiness and weakness; countenance not satisfactory. A strong purgative, viz tincture of aloes and myrrh with the addition of an ounce of oil of turpentine. Evening,—the bowels freely opened; the pulse more vigorous: effervescing draughts continued. *28th*,—some rest; no stool in the night; tongue somewhat brown; gums hot, as from the effects of mercury; castor oil—to be followed by a solution of salts. Noon,—no effect from the castor oil and salts; dejected; sense of weakness; the pulse deficient in vigour: spasms; tremors. The purging tincture of aloes, &c. repeated: frictions of the whole body with mercurial ointment and oil. Evening,—copious evacuation by stool;—great relief: effervescing draughts: camphorated mixture: frictions of the surface. *29th*,—good night,—confused and *distract* in waking from sleep; a copious

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evacuation by stool;—sickness and vomiting while on the night chair;—great relief; tongue dry; a slight increase of thirst, gums hot and somewhat painful; no increase of saliva. Evening,—profuse perspiration; slight cramps or spasms of the limbs. 30th,—slept well; bowels perfectly free,—much better in every respect; relished his food,—bread and tea. Noon,—took soup or bouillon with liking. Evening,—better. 31st,—no fever; complains of feelings of weakness. August 1st,—improves. 2nd,—slight accession of fever,—increased heat: diaphoretic mixture. 3rd,—better,—no fever: bark with acid of vitriol. 4th,—bark with acid of vitriol: affusion of cold salt water.—Recovered.

## CASE II.

Barbados, *October 8th*, 1813.—Johnstone, R. Artillery, aged 43, attacked suddenly about noon with symptoms of fever and admitted into the hospital in the evening. The head-ache was excruciatingly severe—with severe vomiting; the pulse strong and frequent; thirst great. Bled to the extent of four pounds: head relieved; the skin dry. Calomel gr. v., followed by a purging draught: tepid bath: blister to the head. 9th,—little or no sleep; no pain of the head,—no pain of any kind; the skin and even the lips still dry; the tongue whitish; no appetite for food: calomel and antimonial powder every fourth hour. 10th,—no pain; some sleep; perspiration; lips rather dry; no appetite: camphorated mixture with saline mixture every third hour. 11th,—well. 18th,—discharged in perfect health.

## CASE III.

Barbados, *October 31st*, 1814.—W. Watson, R. Artillery, aged 34, seized with the usual symptoms of the fever of the season; the pain of the head very severe,—with some uneasiness in the chest and impediment in breathing; the pulse sharp and frequent. Bled to the extent of four pounds: tepid bath: calomel, followed by a solution of salts: blister to the head. *November 1st*,—no material relief: bled to three pounds: carbon. ammon. gr. xii., magnesiæ alb. gr. xxv., aquæ puræ un.



ii., adde succ. limon. un.  $1\frac{1}{2}$ . *2nd*,—the head-ache abated considerably after bleeding; it returned in the night with violence;—it is now easier, but there are general painful sensations all over—with feelings of weakness or inability; the thirst moderate; the pulse sharp. Bled to the extent of two pounds: tepid bath: the effervescing draught repeated. Noon,—threw up the draught: the body rubbed all over, by two orderlies, with salt and vinegar: calomel gr. x.: small doses of salts and senna. Two o'clock,—the first dose of the purging mixture rejected: clyster:—copious evacuation of a dark feculence: purging mixture repeated. Evening,—considerably better; sickness continues, but not severe. R. tinct. opii. gutt. 40, æther drach. i., aq. ammon. acetat. semunc., mistur. camph. un. i.—to be taken at bed time. *3rd*,—indifferent night; two evacuations by stool in the morning; nausea distressing; sensations of weakness—despondence; apprehension of danger—almost confirmed in the opinion that he is dying. Bled to the extent of twenty ounces—much against his will: purging tincture of aloes and myrrh. Noon,—seems better; no pain or uneasiness; no evacuation by stool: infusion of senna, &c. every other hour. Evening,—straining on the night chair without effect: stimulating clyster: rubbed with stimulating oils: purging tincture of aloes and myrrh with the addition of half an ounce of aq. ammon. acetat. *4th*,—passed a good night; several stools; nausea removed; tongue rather foul—with nausea: diaphoretic mixture. Noon,—head-ache considerable: calomel gr. x. Evening,—purging tincture of aloes and myrrh semunc., tinct. opii. gutt. 40, æther drach. i., mistur. camph. un. i. at bed-time. *5th*,—slept well,—perspired freely; no head-ache; no evacuation by stool: purging mixture repeated: anodyne at bed-time. *6th*,—recovers. *Note*.—Occasional head-ache and giddiness for a few hours. Discharged on the *28th* fit for duty.

## CASE IV.

Barbados, *September 26th*, 1814.—A—w, R. Y. Rangers, had felt more or less of head-ache for three days, but he bore

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up against it in hopes it would go off. He took his regular routine of duty; and, when on guard, was seized about noon with excessive pain of the head, giddiness, insensibility, and total privation of power of the limbs. He was brought to the hospital about two o'clock, almost insensible. Bled to the extent of four pounds: the head shaved and blistered: bathed in warm water: purging mixture. The pulse was hard; the blood flowed freely;—no faintness or disposition to faint ensued, and not much relief. Six in the evening,—the head-ache continues—the pain chiefly in the forehead; the eye is full, but not inflamed; he has no power over himself; the thirst is still great; the tongue not foul; the lips dry; the skin dry; the pulse frequent, small, irregular; no faintness from mobility, but total want of power and energy; one stool from the purgative; heat natural; blood buffy and cupped on the surface. *27th*,—no sleep; the skin dry, but parched; several motions downwards; head-ache continues—chiefly felt at the forehead; the pulse strong, hard,—not full—frequent; the heat above natural,—not high; thirst great; lips dry; tongue rather rough,—not foul; countenance heavy and dull. Bled to the extent of two pounds: the pulse slower and softer,—faintish,—yawned frequently, and had a copious evacuation by stool after the arm was bound up; general perspiration. Noon,—the pain of the head lessened, but not entirely removed; thirst less urgent; the skin soft and moist; the lips still dry; the pulse still febrile, but strong and expansive. Evening,—more animated; the eye and countenance cheerful; the lips moist; thirst diminished; skin moist, or rather perspirable; scarcely any head-ache; no nausea; pulse febrile,—soft and regular. *28th*,—slept quietly in the night; no head-ache; some pains about the calves of the legs; general perspiration; pulse febrile, but regular; no final crisis, but no urgent symptom. Evening,—some return of appetite; no pain of any kind. *29th*,—improves; some desire for food. *30th*,—better. Evening,—convalescent. *October 6th*,—discharged.

## D. SECTION IV.

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VII*General Plan of Cure of the Cachectic Form of  
Fever—the Course progressive.*

The adjustment of a plan of treatment for the cure of the cachectic form of disease, which originates from the action of a febrile cause, constitutes an important subject of investigation to the physician; but it is a subject on which I have not the satisfaction to speak with confidence. I do not recommend that which I have actually done, for it amounts to little; and I regret to add that few military physicians will have the power of doing more than I have done, until a liberal and enlightened policy shall dawn upon the minds of those in power; the military physician may speculate and plan, but he will rarely find the opportunity to act with effect; that is, to prove the truth or falsity of his opinions by scientific experiment that requires a wider range for proof than the wards of a military hospital.

From the facts that fell accidentally under my observation in the course of my official duty, I formed the opinion, and could not abstain from cherishing it, that something might be done, by the medical art, for the relief, if not for the radical cure of cachectic forms of fever; and, as the island of Trinidad, partly from climate, partly from the unhealthy position and the injudicious construction of the barracks in which the troops of the garrison are quartered; has furnished, ever since it was possessed by

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the British, an unusual number of persons suffering from cachectic forms of disease, it was stated, in an official report submitted to the Commander of the forces in the year 1813, that between seventy and eighty of the regiment stationed in that island, viz. the Royal West-India Rangers, were then ill of cachectic fever, the disease so far advanced in progress that, scarcely any hopes of recovery existed for them except by removal from the situation where they then were. The end proposed might be obtained in two ways, viz. by a long cruise at sea in different latitudes under a correctly adjusted regimen; or by a removal to one of the islands within the windward island command. The first, though decidedly the best, was not practicable at the time; it was therefore suggested that the persons in question should be brought to Barbados, placed in a healthy part of the interior, and submitted to a well arranged plan of medical treatment assisted by suitable regimen and discipline. The proposition was made in conscience as a command of duty. It held out a promise of benefit: it could not give confident promise of success—and nothing was done. The cachectics of the Rangers remained where they were: they dropped off from the sick list at the rate of ten or twelve per month until they all disappeared, their places being supplied by others of a similar description, from the operation of the causes alluded to which still continued to operate. Such is the fact—and it is not solitary. It forces the reluctant remark that while the military physician

may, for the most part, treat the sick in what manner he pleases when the sick are in the hospital wards, his suggestions rarely meet with attention when they imply measures of an extended view. General arrangement, even the arrangement which relates to the department of health, is thought to belong to the power which commands at the station ; and, ungracious as the remark may be, the history of mankind furnishes sufficient evidence that official power rarely deigns to receive instruction from science, communicated simply as instruction.

It was intended, if the proposition alluded to had met with attention, to have digested a plan of medical treatment, regimen and discipline for the subjects in question, to have committed the execution of it to an officer of trust, and to have minutely superintended the proceeding in all its detail. Nothing was done : I can therefore only say what was in contemplation to have been done, if the opportunity had occurred of doing it. As the disease under view exhibits a new or diseased form of organization, viz. a congestion of fibrine in all the interstices of the cellular membrane, and in a more especial manner at the base of the heart than others, the direct means of cure consists in resolving the accreted mass. The mass is more like the brawn of pork than any thing else ; and, as the texture is different in degree of compaction, the resolution of it may be supposed to be effected in longer or shorter time, with more or less difficulty, and more

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or less success. It is necessary, with a view to effect the resolution contemplated, to endeavour to induce a condition opposite to that which exists; and, as the disease presents an appearance of undue aggregation, cohesion and compaction of fibrine, the induction of the scorbutic diathesis, which is characterized by tendency to solution, may be thought to constitute the direct means of remedy. The principle of cure is plain: the difficulty lies in giving its execution; and, after the first step is executed, in giving energy to the renewed action of health.

If this form of disease occur in a climate where the endemial tendency is strongly marked, for instance in the island of Trinidad, the first step towards cure consists in removing the subject from the source of the endemial influence, and, as would be reasonably supposed, in removing him to a climate of an opposite character to the one where the indisposition originated. The sea atmosphere implies a change of the greatest extent that can be attained in the same latitude; a cruize at sea, continued for some months in a vessel, properly equipped and provided with all suitable means of remedy by medicine, or diet, has therefore the preference to others. But, if the cruize at sea cannot be attained with all that belongs to it to give it effect, it is evident that the place chosen for residence on shore ought to be remote, in the character of its atmosphere, from that of the district where the disease first arose.—With regard to remedies, abstraction

of blood is not here recommended as one of dependence in primary effect ; it is presumed that it may be useful as auxiliary, by inducing changes in the qualities of the circulating fluid, particularly where abstraction is made with attention to the circumstances of the condition, and where the effect obtained from it is supported and improved by various kinds of friction. The warmer purgatives are to be given occasionally, particularly the alkalized infusion of senna, all the drinks being at the same time alkalized by means of salt of wormwood. Bitters of various kinds may be given with advantage, viz. infusions of wormwood, seneka, scurvy grass, &c. The main change is to be effected through diet and regimen, the diet must therefore consist principally of what is salt and stimulating—little nutritive, and not mucilaginous ;—salt herrings have preference. It will be useful, according to this view of the case, to repeat the abstraction of blood at intervals, attending minutely to circumstances previous to and under the act of abstraction. It is probable that benefit might be obtained from mercurial salivation, particularly where congestions exist in the organs of the abdominal cavity. There are grounds to suppose that a well conducted course of nitric acid would be useful in forwarding the general purpose ; but I have no direct experience to support the supposition. Exercise on horseback, or in carriages, and such exercises, on foot, as can be borne without fatigue may be supposed to be beneficial.—If found to be so on trial, they ought to be

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diligently pursued, followed by frictions with hard brushes in the manner of currying; and further, when the process of resolution has commenced, a course of chalybeates, aromatics, and attenuants may be instituted with prospect of benefit. If the means here suggested be combined and alternated, diminished or increased as occasions indicate, there is reasonable expectation that health may be re-established on many occasions; but I cannot affirm that it has been so in any. The practice recommended has not been proved by experiment; it is only suggested for trial by those who may be more fortunate in finding opportunity of trying it than I myself have been.

## E. SECTION V.

*General Plan of Cure of the Cachectic Form of Fever, where the Tendency of the Action is Retrograde or Liquescent.*

The cure of the cachectic form of disease, where it assumes the retrograde tendency, owes so much of its efficiency to arrangements that depend on the chief executive authority, that the science of the medical officer is frequently reduced to nullity; inasmuch as he is compelled to speculate on what might be, not enabled to try experiment, and state from experience that he has done something which deserves to be recorded. If the form of disease in question be locally endemic during a certain season



of the year, the first step, in instituting a plan of cure, obviously consists in removing the subject of disease to a situation dissimilar in qualities to that which he then occupies.—This is the first step, and it is the most important: but the execution of it depends upon other authority than that of the medical officer; consequently it cannot be calculated upon as a part of the physician's means of remedy. These consist in drugs and diets: with these he endeavours to do something; he rarely, I believe, succeeds in doing any thing that is effectual. The disease proceeds in its course. It is sometimes more simple in its form, sometimes more complicated; but it usually proceeds to a fatal termination, of whatever form it be, unless opportune changes of weather conspire, with other contingent causes, to stop its progress before it has advanced to the point from which there is no return.—I have not myself had much opportunity of seeing this form of disease at the quarter where I principally resided, and my official situation did not permit me to remain a sufficient length of time in the districts where it prevailed, so as to institute a plan of systematic treatment for its cure, and to bring the truth or falsity of the opinion I might assume on the subject to proof by fair experiment. The plan therefore which I now propose is rather an induction from reasoning on the laws of animal action, than a relation of ascertained practice; and I am moreover aware that there are parts of it which will not fail to offend common opinion.—The pro-

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position of abstracting blood, from a system tending to dissolution, will be deemed an extravagance. I do not deny that, without accompaniment, the simple abstraction will be the means of accelerating, rather than of retarding the progress of the disorganizing process; but managed as I propose that it should be managed, it is not only safe, but as I believe materially conducive in facilitating the cure. My own experience satisfies me that the blood undergoes a change under the act of abstraction. The change, as is proved by what occurs when the blood is received into a cup and allowed to rest, is sometimes, from a loose and dissolved mass, to a mass that is comparatively firm and cohesive. This effect commonly follows the act of simple abstraction; but the effect is assured, and carried to a higher point of efficiency by modes and accessory means of management, employed at the time of abstraction to stimulate and excite the activity of the living principle. Impressed with the truth and importance of this observation, I recommend bleeding in the case under view. I caution against bleeding through a large orifice and in large quantity at one time. The quantity of twelve or fourteen ounces is here a high measure: it is not however a measure that compromises safety, particularly if stimulation be applied to the subject under the act of abstraction.—One bleeding is rarely sufficient: repetition is necessary; and repetition may be made with safety and beneficial effect.—Among the forms of stimulation to be employed

while the blood flows, or soon after the arm is bound up, aspersion of the body with cold water, actual affusion of cold water, washing the skin with salt and vinegar, salt and lime juice, or *eau de Cologne*, aided by gestation in the open air in a spring carriage, are the most important and the most easily commanded. Acid of vitriol, bark, alum, zinc, steel, tincture of aloes and myrrh as a purgative, powder of charcoal, singly or with rhubarb, stand among the principal of the internal remedies.—Such is the outline of the proposed plan of cure. I have not had the opportunity, as already observed, to give it a full trial; but from what I have seen, when parts of it have been applied in a secondary or contingent manner, I think myself warranted to recommend it, and even to speak with some confidence of its probable good effects.

## CASE.

Barbados, *April 24th*, 1815.—B——n, York Chasseurs, admitted into hospital to-day; had been indisposed for some days prior to admission. The symptoms of the fever were moderate:—the head-ache was not severe; the pulse was frequent; thirst considerable; skin dry or damp—inelastic; tongue red; purgatives, diaphoretics, &c. *May 5th*,—extremely weak; the pulse small and frequent,—scarcely perceptible, at least scarcely to be counted; the tongue red and clammy; the skin cold and damp,—the surface without animation; no pain; sleeps a good deal; takes nourishment; has not much thirst; and is perfectly sensible. *6th*,—pulse scarcely perceptible; not delirious,—does not speak. Evening,—pulse perceptible; skin moist; swallows drink; sensible. *7th*,—delirious in the night,—now sensible; pulse just perceptible. *8th*,—died in the morning.

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*Opened.*—The pia mater somewhat inflamed; adhesions at the falx; water in the ventricles and at the base of the brain in considerable quantity; the substance of the brain flaccid and soft, or liquescent; the lungs filled with black blood; the liver soft; the omentum like an old dirty rag; the colon exceedingly distended through its whole extent and gangrened in some places, but without appearance of such form of action having existed previously as goes by the name of inflammatory.

## F. SECTION VI.

*General Plan of Cure, where the Febrile Act is manifested on the Base of the Serous Temperament.*

The forms of fever, which occur under the predominance of the serous temperament, described at page 138, are numerous and important. The general principle by which the cure is to be directed is the same as in the preceding temperaments: it admits of more or less modification in the application according to the circumstances of the subject. The serous portion of the blood, which is regarded as the ostensible subject of febrile action in the present case, must be considered as the receptacle of acrimonies; and, as acrimonies are destined for expulsion, the movements of the morbid act are here necessarily manifested upon organs of excretory function. The forms of fever which occur under the serous temperament manifest their action under two general outlines, viz. constrictive or relaxed. Constriction of the excretory organ and di-

minution of the excretory discharge, as connected with preternatural force, may be classed with the progressive; undue relaxation, with excessive profusion of discharge, rank with the retrograde or solutive. The condition is different; but the constituted action of the organ is changed or perverted in both; and both, in this manner, fall under one general principle of cure. The first step in the cure consists in the arrest of the perverted action, whether the action be increased or diminished; the second, in the application of means which solicit action, analogous with that of health, which is similar in all. I conceive the principle to be understood from what has been already said; I shall therefore only notice in a very cursory manner the more essential of the means employed for the attainment of the purpose. The application of the means, viz. combinations and alternations, must be left to the discretion of the acting physician. The modes are so much varied in the various forms, under which fevers of the serous temperament shew themselves, that specific direction on a subject so ill to be defined, would tend to embarrass rather than to elucidate the course of the proceeding.

When a person, possessing the serous base of temperament, is submitted to medical care soon after the commencement of fever, it is advisable, whether there be undue constriction or undue relaxation, that he be immersed in a warm bath for the purpose of equalizing action throughout the whole of the excretory system. When that end has

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been in some degree attained, a vein is to be opened in the arm, and blood abstracted in quantity sufficient to effect a change in the existing condition. It is impossible to say *a priori* what the necessary quantity may be. It is only actual inspection of the case which can give an idea of it; but we may venture to say that, in forms which are marked by relaxation, the measure can scarcely be supposed to exceed two pounds; in forms that are purely constrictive, or irregularly mixed, three, and even four may sometimes be not more than sufficient. When the change contemplated has been completely attained, the patient is to be raised up and submitted to the affusion of cold water on the head and shoulders, wiped dry and conveyed to bed, an emetic given as soon as may be, followed at a proper interval by a purgative—strong or gentle, as circumstances may indicate.—The acetated water of ammonia in large doses, repeated at intervals with plentiful dilution by means of rice or barley water, improves the good effects of the purgative. It moreover acts on the mixture of the fluids; and thereby maintains the excretory organ in activity. If the disease be not decisively arrested, or moved into a safe train of action by the process here recommended, it may be necessary to repeat the bleeding, and to carry it to the highest warrantable extent under the eye of the physician. It is generally proper to repeat the bathing, viz. warm and cold alternated at certain intervals, also to continue the diaphoretics and diluents, and such other forms of

stimulation as are calculated to maintain artificial energy in the excretory function, until the dangerous periods of the disease pass over.

The cure of fever in subjects of the serous temperament, like the cure of most other fevers, is a matter of easy accomplishment at the commencement. If two or three days have elapsed before it be brought under treatment, the difficulty is considerable—sometimes extreme. The heat of the body is often high, acrid, caustic and peculiar: the skin often becomes so dry and obstinately locked, at certain periods of the course, as if the albumen of the blood were actually coagulated in the serous capillaries of the surface. I do not pretend to say, from ocular testimony, that this coagulation actually exists; but I believe it to be possible, and, from the density and peculiar compaction of the skin which refuses moisture to the most powerful diaphoretics, I consider it as probable. The instances of recovery from the extreme degree of exsiccation alluded to are few; and, where recovery does take place, in such case, the skin is long in regaining its permeability, its unctuousity, and its smoothness.—If, instead of density and compaction, the surface should be bathed with colliquative sweat, the danger is great, but not irremediable. A number of means present themselves for trial on this occasion; but, when I mention abstraction of blood as one of the number, I do not expect to make converts to my doctrine. It is not however a mere theory: I have some experience

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of its benefits and I have confidence in its power, especially if seconded by ablution with cold salt water, washing the body with vinegar and salt, lime juice and salt, herring pickle or other brine, aided by gestation in the open air in a spring carriage, frequent changes of bed and body linen, together with bark, acid of vitriol, alum, zinc, camphire, tincture of myrrh and aloes as a purgative, wine and other refreshing and stimulant cordial.—I have already stated my opinion respecting the effect which subtraction of blood operates on the mass, in changing quality by diminution of quantity; and, as organic actions depend on the impulse of blood, we may fairly infer that changes occur in the actions corresponding with the changes which occur in the nature of the impulse; insomuch that if, to this change of impulse, be opportunely added suitable stimulation, the action, from feeble and languid, ordinarily becomes energetic and strong—and analogous with that of health; in other words, the disease is cured.

## CASE I.

Barbados, *August 17th*, 1813.—D.—, R. Y. R., admitted into the hospital about noon, having been attacked the day before with symptoms of fever. At the time of admission he appeared squalid and dirty; head-ache was severe, even to stupor: bled to the extent of twenty ounces; easier, but not much; the skin hot and dry, arid and parched; the pupil of the eye contracted; the countenance sallow; the skin thick, harsh and disagreeable to the touch. Immersed in the warm bath; rubbed with soap and scrubbed with brushes; the head shaved; a vein



opened, and blood abstracted while the body was under immersion; cold water poured upon the head and shoulders; the body washed with salt and vinegar; a blister applied to the whole of the head; purging mixture—ordered to be given at intervals until effect was produced. 18th,—better: copious evacuations by stool; copious perspiration; intellect acute—and no head-ache. 20th,—no return: 25th,—discharged.

## CASE II.

Barbados, *August 14th*, 1814.—B——n, R. Y. R., attacked at noon with severe head-ache,—the pain in the crown of the head, accompanied with vomiting, faintness, cold sweats, &c.: bled, but fainted before twenty ounces were abstracted: vomited; the head-ache excessively severe; thirst excessive; the lips dry and pale; the countenance collapsed, withered and blighted; the skin dry, shrunk and without animation; the pulse frequent and irregular. 15th,—bled largely last night; fomented with flannels wrung out of hot water for a length of time:—purgative mixture: head-ache relieved; thirst diminished, but still considerable; vomited only once during the night; several evacuations by stool; skin dry and rather warm; countenance full and expanded:—somewhat flushed; pulse febrile—frequent, but distinct. 16th,—better: slept; perspired; tongue rather dry; thirst; pulse febrile. 17th,—continues to improve:—18th,—better:—25th,—discharged.

## CASE III.

Barbados, *November 1st*, 1814.—B——, R. Artillery, seized suddenly with general numbedness, pain and spasm at the stomach and in the bowels, with such constriction about the throat as almost entirely denies passage to drink; pulse scarcely perceptible. Put into the warm bath; rubbed with soap and scrubbed with brushes: bled to the extent of three pounds,—not much, if in any degree, relieved. At an interval of some hours, immersed into the bath a second time, and more blood

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abstracted from the arm—the quantity not stated: somewhat easier. Evening, nine o'clock,—respiration thick and short,—but not such as indicates impediment in the lungs; the pulse just perceptible—small and frequent; skin dry; thirst great; eye and countenance desponding and expressive of internal suffering: tincture of opium, æther, valerian, &c; blister over the chest. *2nd*,—no sleep; vomited repeatedly during the night; now great thirst; respiration short; anxious and distressed as from suffering at the stomach. Noon,—bled while immersed in the bath; the quantity abstracted exceeding two pounds: it flowed freely, or rather ran out without action into the vessel, somewhat in the manner as if a cask of liquor had been tapped; respiration relieved; no pain; great thirst; mouth clammy; bowels open; vomits; skin less dry; pulse perceptible; heat natural; starts and wanders when he closes his eyes. Evening,—no vomiting since two o'clock; has slept a little; tongue clammy; bowels open; skin soft; heat natural; pulse more perceptible:—distinct. *3rd*,—dozed in the night,—no sound sleep; bowels open; stools perfectly black; thirst diminished—but still considerable; no vomiting; pulse open—distinct and regular; skin moist, or rather damp;—sweat not fluid; no pain. Evening,—pulse low—not very distinct. *4th*,—dozed in the night; pulse more distinct; skin moist; no pain; thinks himself better. Evening,—has slept a good deal in the course of the day; the pulse distinct; no desire for food; feelings of weakness. *5th*,—sensations of weakness; did not sleep much; thirst considerable; tongue clammy; eye clear; no local pain; skin soft; pulse regular—distinct—not frequent. Evening,—some appetite for food; less thirst. *6th*,—did not sleep much, but seems upon the whole to gain; thirst diminished; the tongue tremulous. Evening,—a copious dark-coloured stool from castor oil; took soup with relish; little increase of thirst. *7th*,—better. *8th*,—no complaint. *12th*,—discharged.

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*General Plan of Cure, where the Febrile Act is manifested principally in the Sentient System—Animal or Intellectual.*

The organ of sense and intellect is more or less morbidly affected in most conditions of febrile disease. Sensibility is sometimes latent, or suppressed in an unaccountable and inexplicable manner, sometimes excited to an extraordinary degree of activity. The character of the mode is influenced by the forms of general constitution. But, though this be so, we cannot pretend to ascertain, with precision, the manner and degree of connection between radical constitution and contingent action; for, though the latent or suppressed sensibility is more common in the lymphous temperament, excited sensibility in the sanguine, irritated and irregular in the serous, yet we should probably err if we attempted to calculate, at least trusted to calculations made on that ground.

The means which present themselves as remedial, in different forms of morbid action manifested on the sentient system, rank under two general heads, viz. such as excite action by ordinary rule, and such as excite new forms of action by a species of power, which supersedes, and, in an unknown manner, absorbs in itself the action of the disease. Suppressed sensibility—corporeal or mental, is sometimes conspicuous as a prominent symptom at the commencement of fever; it sometimes continues characteristic

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throughout with aggravations or alleviations at particular times ; sometimes it returns at fixed periods in distinct and regular paroxysms ; sometimes it is continual, but does not shew itself until a late stage of the disease's course. The converse, viz. excited sensibility, follows a similar rule, sometimes early and periodic, sometimes continued, but late in appearance. The mode of latency presents itself under two views, viz. obscure and dormant, as an original act of the morbid cause ; or deficient and void, as an exhaustion from preceding violence. The converse is also characterized by two modes, viz. mobility without force, giving different forms of tremors, faintings, &c. ; or irritation with violence, manifesting spasm and convulsion.

In the first form of latent or suppressed sensibility, considered as a mode of febrile action, the application of artificial heat, more particularly dry heat, presents itself as an obvious remedy. The application of heat by means of the bath—water or vapour, is the most common. It has advantages, as being the most diffusible and the most easily applied to all parts of the body in an equal degree ; but it also has disadvantages, inasmuch as it cannot be continued for a sufficient length of time to assure the full effect. If the warm bath be the remedy approved, the temperature must be a high one—not less than one hundred degrees of Fahrenheit's thermometer ; and this, even high as it may appear to be, is not always sufficient to communicate the requisite comfort to the feeling of the pa-

tient, whose sensibility to the impressions of heat is now singularly impaired. The stimulating power of the warm bath is increased by the addition of ammonia, essence of mustard, and above all by *eau de Cologne*. It is unnecessary to add that friction of the skin, particularly of the extremities, by means of brushes and soap, wine, spirit, or other stimulating cordial given internally conspire to augment the effect of the stimulating process. The change contemplated is not soon effected, where sensibility is repressed by the action of a strong cause; consequently the body is not to be removed from the bath in less than one hour, or one hour and a half: When the patient has been removed from the bath and conveyed to his apartment, the air of which is supposed to be pure and of a high temperature; the body, after being thoroughly dried, is to be rubbed, for some time, with hot flannels, as hot as they can be made, afterwards rubbed with volatile liniment, or washed with *eau de Cologne*, clothed with flannel, covered with bed-clothes, a half-burnt billet of wood wrapped in flannel being laid at each side, hot bricks placed at the feet, and bags with heated sand, or bran applied to the stomach and over the whole of the abdomen. Wine or other cordial is to be given at discretion. The purging tincture of myrrh and aloes, with the addition of an ounce or more of oil of turpentine, is also of benefit. It stimulates by its warmth and opens the bowels with more or less relief, even with some effect upon the general condition of the disease. Blisters are often serviceable. Com-

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mon opinion revolts from the idea of subtracting blood in a case similar to the present; but, as there is no risk from the experiment while the body is under the influence of stimulation, viz. bath or dry heat, it is advisable to open a vein in the arm, in the view of changing the condition of circulation in the interior organs. I have not indeed myself made the experiment in its full extent; but I believe it may be safely made under the circumstances stated, and I presume, from analogy, that it may be made usefully. If torpor and inability follow highly excited action, exhaustion of power, rather than dormancy, is implied in the condition; consequently rest, cordial refreshments, sprinkling or washing the body with cold water are obvious remedies; but gestation in the open air presents itself in this case above all others as the most suitable,—the most permanent restorative of the exhausted condition, and while so implying the fewest chances of danger in management.

If sensibility be increased—mobility manifested in an extreme degree by tremors, faintings, &c. accompanied by delirium or without delirium, aspersion of the body with cold salt water, gestation in the open air in a spring carriage or other suitable conveyance, cordial wines repeated at intervals, and opium in quantity sufficient to impress the system lightly, have appeared to myself to be on all occasions safe, and on many occasions effectual remedies. If sensibility be increased, irritation violent, manifesting spasms and threatening convulsions,

a warm bath of moderate temperature, fomentations with flannels wrung out of hot water, and friction of the whole body with cold olive oil are obvious remedies, and they are not ineffectual ones: they soothe, and if they do not entirely remove, they rarely fail to moderate. Bleeding from a vein, or cupping at the neck or temples is of service occasionally; but it is not primary in the plan of cure. Blisters to the nape of the neck, continued along the spine to the interval between the shoulders, are often of benefit. Opium, with camphire and James' powder, is a principal remedy, either under the existence of the disease, or, as preventative of its recurrence, where its character is periodic. Opium is beneficial with the additions here recommended; it is inferior to ten or twelve grains of pure and recently made cob-web, whether given with the view of repressing spasms, delirium and threatenings of convulsion, or given in the interval with a view to prevent the recurrence of these symptoms.

## CASE I.

Barbados, *October 30th*, 1813.—Walters, R. Artillery, aged 27, seized about four in the afternoon with violent cramp in the limbs:—before he reached the hospital delirium had become furious. The pulse was strong and frequent; the delirium wild and outrageous. Bled to the extent of six pounds: calomel, followed by a solution of salts: blister to the nape of the neck. 31st,—uneasiness at stomach, vomited frequently during the night, but slept at intervals: the delirium removed by the blee-

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ding; the pulse now nearly natural; the skin cool, but dry: solution of salts repeated: head shaved and blistered: blister to the pit of the stomach: tepid bath: friction of the whole body with hot oil after removal from the bath: clyster. Frequent copious evacuations by stool soon after the clyster. Evening,—anodyne draught with æther. *November 1st.*—easy in his feeling; bowels open; vomiting and uneasiness at stomach removed; sleep sound: saline mixture. *2nd.*—infusion of bark. *9th.*—discharged.

## CASE II.

Barbados, *October 23rd*, 1813.—Arkins, R. Artillery, aged 24, admitted into hospital to-day, had been indisposed for two days previous to admission. He complained of head-ache and of pain in all parts of the body: the pulse was hard, frequent and peculiarly irritated; the tongue dry; nausea; vomiting; coldness and tremors to considerable extent and of long continuance. Bled to an extent exceeding four pounds: warm bath: calomel and rhubarb: clyster. Calomel and rhubarb rejected; one dark coloured stool from the clyster: tremulous; vomits at intervals. *24th.*—sense of coldness; cold perspiration; tremulous and agitated; vomits now and then; thirst considerable. *25th.*—sickness and vomiting in the night; no sleep; tongue foul; bad taste in the mouth,—nauseous, unusual taste; skin moist,—moisture clammy. Evening,—signs of commencing delirium—tremors, agitations; skin cool—moist; pulse irregular, agitated, fluttering; no vomiting. Seized with convulsions between eight and nine o'clock—and died immediately. *Opened* next morning.—No marks of disease in the substance of any of the abdominal viscera; a few red spots like heads of pins on the inside of the stomach—most numerous near the cardiac orifice;—no spreading inflammation. No marks of inflammation in the substance of the brain or its membranes; more water than usual in the ventricles:—the cause of irritation which occasioned the convulsion not discovered.



## CASE III.

Barbados, *October 29th*, 1813.—Smith, R. Artillery, aged 22, attacked with symptoms of fever and admitted to-day: delirious and wild, complaining severely of the head, stomach and belly—about the navel; pulse small. Bled to the extent of three pounds: calomel and solution of salts: blisters to the head and nape of the neck. *30th*,—delirium removed; complains of great pain in the abdomen,—increased by pressure; vomits. Bled to the extent of twenty ounces while immersed in the warm bath: castor oil: blister to the abdomen. *31st*,—bowels open; pains removed. *November 5th*,—discharged.

## CASE IV.

Barbados, *November 2nd*, 1813.—Clarke, R. Artillery, aged 23, had drunk to excess on the *1st* of *November*, seized with giddiness, pain of the head and very acute pain in the breast;—brought to the hospital in the evening. The eye appeared red and inflamed; the pulse was hard, strong, and frequent; the skin sometimes hot and moist, sometimes cool and dry; the tongue foul; the thirst excessive; the bowels torpid; nausea, vomiting, &c. Bled to three pounds; fainted under the flowing of the blood: pain of the head diminished—not entirely removed; the pain of the breast is still felt, but it is less severe; the skin is cool—with sensations of coldness, even after the warm bath and frictions with warm oil. Calomel gr. x.: solution of salts: warm bath repeated: blisters to the head and breast: body rubbed with hot oil. *3rd*,—head-ache and pain at the pit of the stomach; pulse frequent, strong and hard; tongue foul; thirst great; bowels not freely open; evacuations small—with frequent desire for the night chair; vomits now and then. Noon,—bled to the extent of two pounds: pain of the head removed; a sense of weight at the præcordia,—irksome; throws up drink and medicine; the slightest motion, as turning in bed, occasions sickness; no evacuation by stool; gripping pain about the navel. Sugar of lead—ten grains, crystals

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of tartar—two drachms, a quart of boiling water—a wine glass full every two hours: he rejected the first dose; pulse quick and frequent—not weak, but not expansive; sense of heaviness at stomach continues. Evening,—thirty drops of tincture of opium added to the solution of sugar of lead. *4th*,—rested pretty well; no more vomiting; skin warm; one small evacuation by stool; tongue clean; eye clear; sense of weight at stomach still continues. Calomel and extract of colocynth at intervals: mercurial ointment rubbed into the thighs. Evening,—four copious stools; no vomiting; skin open;—moisture fluid and free; pulse expansile; no pain; took soup with relish. *5th*,—slept well during the night; no pain or uneasiness; gums hot and painful. *6th*,—considerable salivation; no fever. *Note*.—The salivation was troublesome for eight or ten days; when it ceased, he was discharged apparently in health. He returned on the *23rd* of *November*, complaining of violent headache, giddiness, and vomiting. He was bled until he fainted; the fixed pain of the head ceased, but shooting pains with vertigo still occur at times: bathed and blistered: calomel and salts. *24th*,—eye clear; tongue foul; thirst considerable; pulse open; skin moist; bowels costive: castor oil:—the oil operated. *25th*,—better. *26th*,—better. *27th*,—no complaint:—recovered rapidly.

## CASE V.

Barbados, *March 19th*, 1814.—Gribant, aged 27, admitted into hospital on this morning, complaining of head-ache and giddiness, with universal tremor, nausea and vomiting; pulse irregular, small and frequent. Bled to the extent of four pounds:—faint,—the pain of the head relieved: warm bath: calomel, followed by a solution of salts. Noon,—salts rejected; nothing retained: warm bath repeated,—rubbed with soap and scrubbed with the brush,—removed from the bath; a draught with laudanum and æther. Evening,—not relieved; giddiness and confusion of the head distressing; vomiting troublesome: immersed in the warm bath: bled to the extent of twenty-four ounces: the pulse more regular; giddiness diminished: the

body rubbed with warm oil: blister to the epigastrium: effervescing draught: twenty grains of charcoal with two grains of opium:—vomiting stayed for some time. *20th*,—uneasy in the night; no sleep; no vomiting; nausea continues; thirst considerable; tongue foul; no evacuation by stool: twenty grains of powder of charcoal with fifteen of extract of colocynth. Noon,—stomach retentive; no evacuation by stool: clyster:—a small, dark fetid evacuation; skin soft,—cool; pulse more regular. Evening,—thirst moderate; skin moist; pulse improved: purgative repeated: enema. *21st*,—no vomiting; copious evacuation by stool during the night; tongue foul; pulse good; slept in the night: calomel and rhubarb: diaphoretic mixture. *22nd*,—slept well; skin moist; tongue clean. *23rd*,—better. *26th*,—discharged in perfect health.

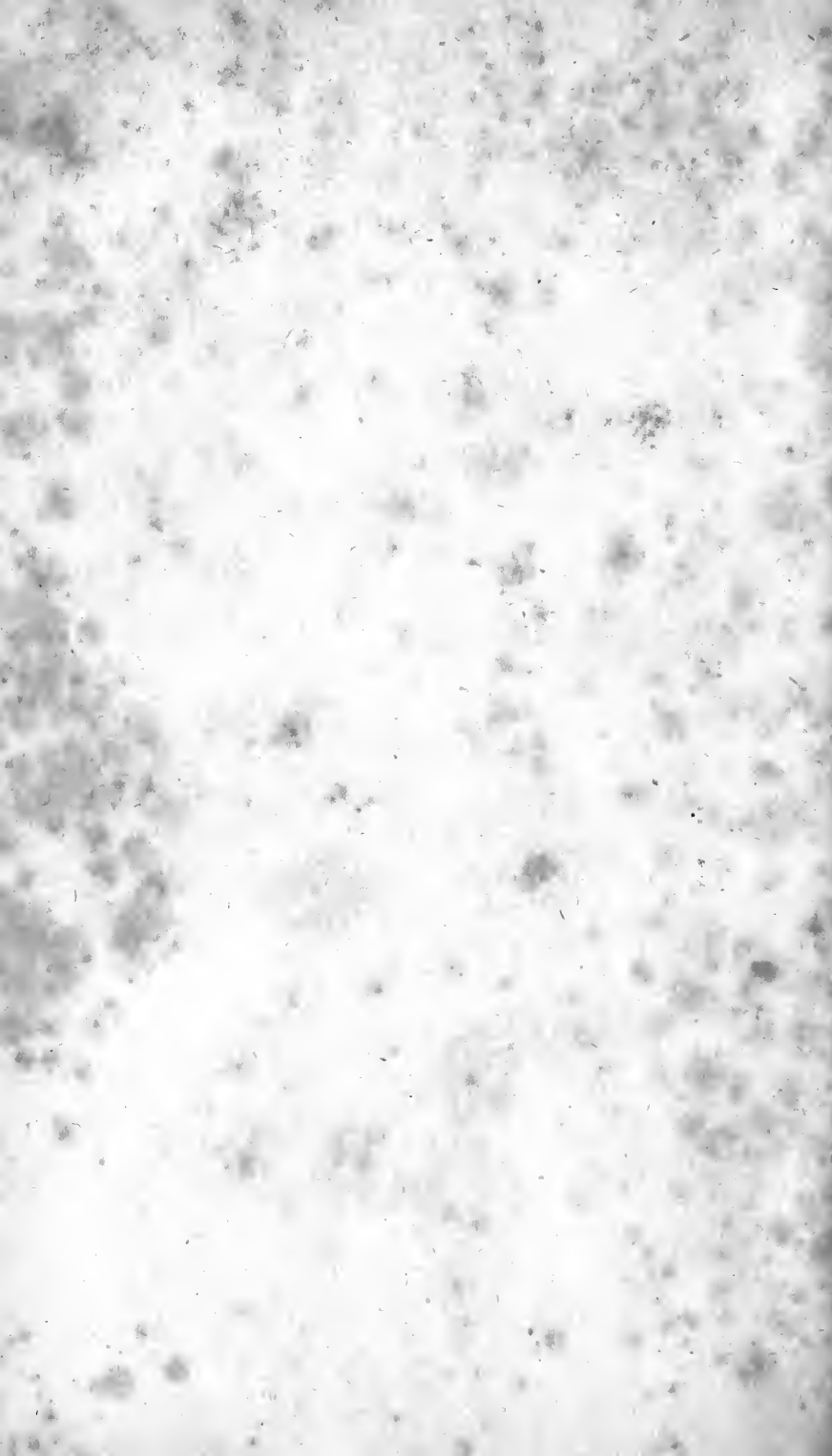
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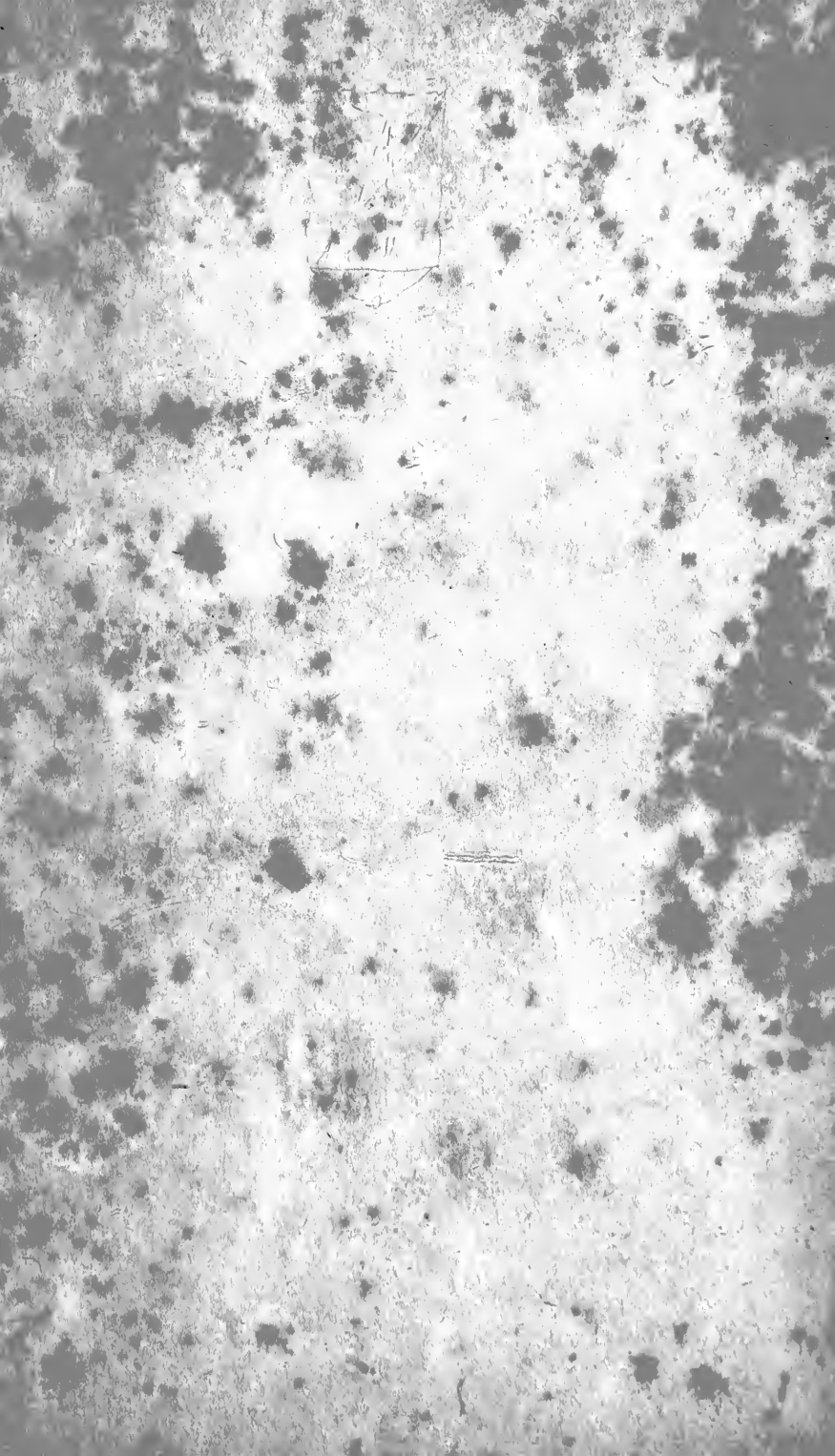


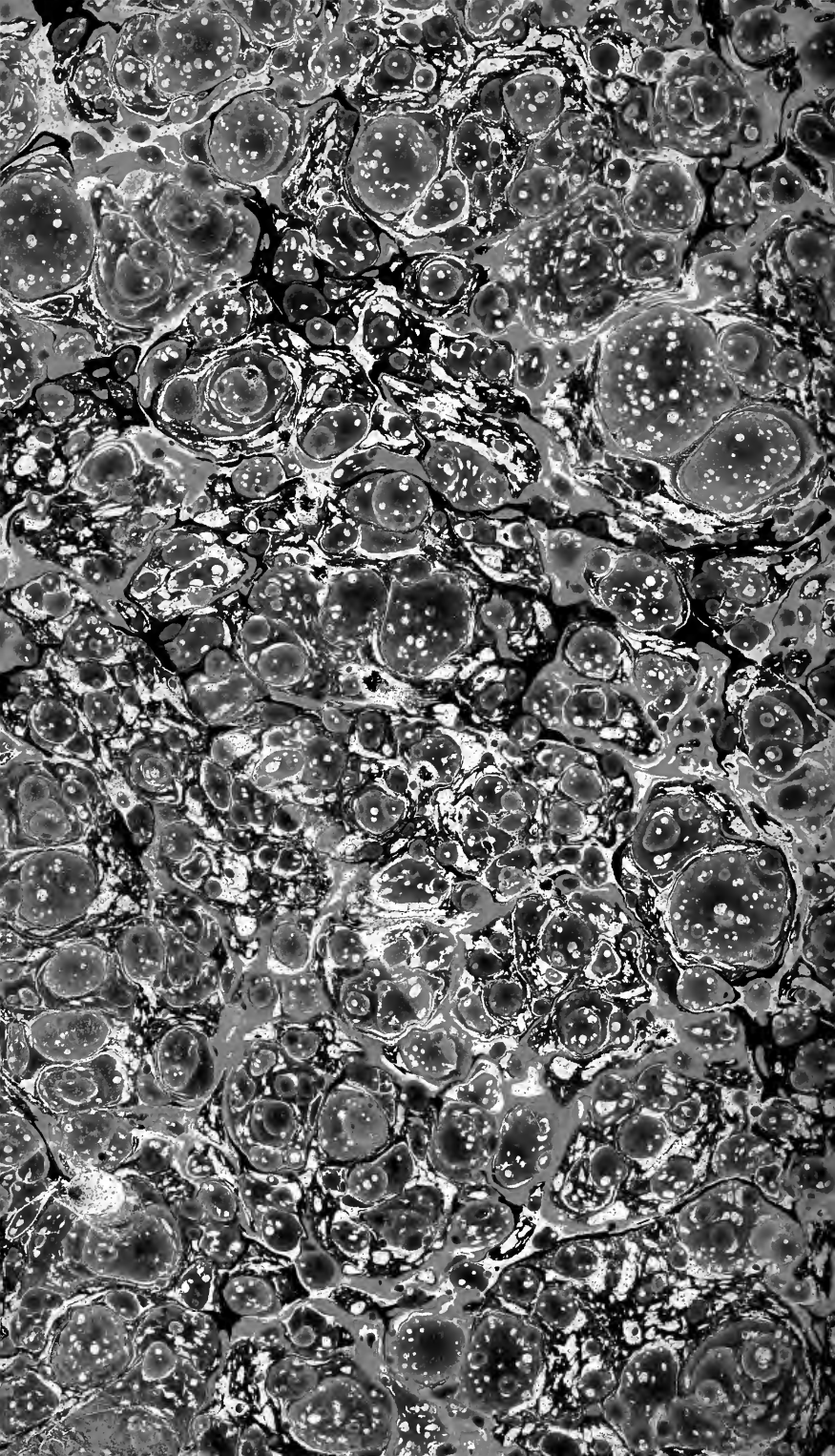












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